04

SIMPLE INTEREST

Simple Interest

SI is nothing but the fixed percentage of the principal (invested/borrowed/amount of money).

Some key words

- **Principal (P) :** It is the sum of money deposited/loaned e.t.c. also known as "Capital".
- **Interest :** It is the money paid by the borrower, calculated on the basis of Principal.
- **Time (T/n) :** This is the duration for which money is lent/borrowed.
- **Rate of Interest (r/R) :** It is the rate at which the interest is charged on principal.

Amount (A) = Principal + Interest

Some Basic Formulae

- **Simple Interest (SI):**

$$SI = \frac{P \times R \times T}{100}$$

P = Principal, r = rate of interest (in %)

t = time period (yearly, half yearly etc.)

$\therefore$ **Amount (A)** = P + SI = $P + \frac{p\,r\,t}{100} = P\left(1 + \frac{rt}{100}\right)$

Some Useful Short-cut Methods :

1. If a certain sum in T years at R % per annum amounts to Rs. A, then the sum will be

$$P = \frac{100 \times A}{100 + (R \times T)}$$

2. If a certain sum is invested in n types of investments in such a manner that equal amount is obtained on each investment where interest rates are R_1, R_2, R_3, ...Rn respectively and time periods are T_1, T_2, T_3, ...Tn respectively, then the ratio in which the amounts are invested is :

$$\frac{1}{100+R_1T_1} : \frac{1}{100+R_2T_2} : \frac{1}{100+R_3T_3} : .... \frac{1}{100+R_nT_n}$$

3. If a certain sum of money becomes n times itself in T years at simple interest, then the rate of interest per annum is

$$R = \frac{100(n-1)}{T}\%$$

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

$$T' = \frac{(m-1)}{(n-1)} \times T$$

5. Effect of change of P, R and T on simple interest is given by the following formulae :

Change in Simple Interest

$$= \frac{\text{Product of fixed parameters}}{100} \times$$

[difference of variable parameters]

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

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

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

$$\text{S.I.} = \frac{RT}{100} \times (P_1 - P_2)$$

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

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

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

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

and, $R = \frac{A_1 - A_2}{A_2T_1 - A_1T_2} \times 100$

7. If a sum P_1 lent at simple interest rate of R_1% per annum and another sum P_2 at simple interest rate of R_2% per annum, then the rate of interest for the whole sum is :

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

8. When there is a change in principal (P), rate (R) and time (T), then the value of simple interest (I) also changes and is given by

$$\frac{I_1}{I_2} = \frac{P_1 \times R_1 \times T_1}{P_2 \times R_2 \times T_2}$$

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

$I_1 = A_1 - P_1$ and $I_2 = A_2 - P_2$

9. Out of a certain sum P, $\frac{1}{a}$ part is invested at R_1%, $\frac{1}{b}$ part at R_2% and the remainder $\left(1 - \frac{1}{a} - \frac{1}{b}\right)$ say $\frac{1}{c}$ part at R_3%. If

the annual income from all these investments is Rs A, then the original sum is given by

$$P = \left(\frac{A \times 100}{\frac{R_1}{a} + \frac{R_2}{b} + \frac{R_3}{c}} \right)$$

1. A Sum of Rs. 4000 is lent for 5 years at the rate of 15% per annum. Find the interest.
   (a) Rs. 3000 (b) Rs. 2000
   (c) Rs. 1000 (d) Rs. 1500
   (e) None of these

Sol. (a) $S.I = \frac{P' R' T}{100}$

P ® 4000

R ® 15%

T ® 5 years

So, $S.I. = \frac{4000' 15' 5}{100} = Rs.3000$

Alternate

Here, r = 15%

t = 5 years

Therefore the interest will be (15×5) = 75% of the sum

Thus, Interest = $\frac{4000' 75}{100}$

= Rs. 3000

2. If the simple interst on Rs. 625 increases by Rs. 25 when the time increases by 2 years. Find the rate percent per annum.
   (a) 2% (b) 3%
   (c) 1% (d) 0.5%
   (e) None of these

Sol. (a) Here, the extra interest $\left(\frac{25}{625}' 100\right)\%$ = 4% of the sum.

Since, the increased time is two years therefore the extra interest would be (2 ×r)% of the sum (where r is the rate of interest)

Now,

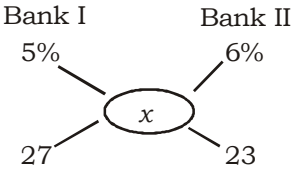
We can conclude that (2×r)%= 4%

□ r = 2%

3. A man deposits Rs. 1350 in a bank at 5% per annum and Rs. 1150 in another bank at 6% per annum. Find the rate of interest for the whole sum.
   (a) 5.40% (b) 6.40%
   (c) 5.46% (d) 111%
   (e) None of these

Sol. (c) Here the ratio of investments is 1350 : 1150 = 27 : 23

Now, using Alligation method



Where x is the rate of interest for the whole sum.

Now, $x = \frac{5' 27 + 6' 23}{(27+23)}$

$= \frac{(135+138)}{50} = \frac{273}{50}$

= 5.46%

4. The simple interest on a sum of money is $\frac{4}{9}$ of the principal, and the number of years is equal to the rate per cent per annum. Find the rate per cent.
   (a) $6\frac{2}{3}\%$ (b) $5\frac{3}{5}\%$
   (c) $7\frac{2}{3}\%$ (d) $6\frac{1}{3}\%$
   (e) None of these

Sol. (a) From the given statement in the question part we can conclude that ratio of sum and interest is 9: 4.

and, Rate % = Time = x

In the above case interest is x^2 % of the sum i.e.

$= \frac{9' x^2}{100} = 4$

$x^2 = \frac{4' 100}{9}$

$x = \frac{20}{3} = 6\frac{2}{3}$

Thus, the required rate of interest is $6\frac{2}{3}\%$

5. If the simple interest on Rs. 1350 be more than the interest on Rs. 1250 by Rs. 20 in 2 years, find the rate percent per annum.
   (a) 5% (b) 10%
   (c) 6% (d) 8%
   (e) None of these

Sol. (b) 1250 + 100

↓

2 years — 20

1 year — 10

$R = \frac{10}{100} \times 100$

= 10%

Alternate

We know that Rs. 20 is the interest for 2 years on the sum (1350–1250) = Rs. 100

Hence, the required rate of Interest = $\frac{20' 100}{100' 2}$ = 10%

6. If the simple interest on Rs. 375 increases by Rs. 75, when the rate % increases by 5% per annum. Find the time.
   (a) 2 years (b) 8 years
   (c) 4 years (d) 9 years
   (e) None of these

Sol. (c) Here the extra interest = Rs. 75 Rate = $\frac{75}{375}' 100$ = 20% of the sum.

Now, we have 5 × t = 20

□ t = $\frac{20}{5}$ = 4 years

7. What annual installment will discharge a debt of Rs. 4,200 due in 5 years at 10% simple interest?
   (a) Rs. 700 per year
   (b) Rs. 350 per year
   (c) Rs. 750 per year
   (d) Rs. 650 per year
   (e) None of these

Sol. (a) Installment =

$$\frac{\text{Principal} \times 100}{100 \times t + (t_{n-1} + t_{n-2} + t_{n-3}.....+) \times R\%}$$

P = 4200

T = 5 years

R% = 10%

then According to the question

Installment

$$= \frac{4200 \times 100}{100 \times 5+(4+3+2+1) \times 10}$$

$$= \frac{4200 \times 100}{600} = \text{Rs. } 700$$

8. In what time does a sum of money become thrice at the simple interest rate of 8% per annum?

(a) 30 years (b) 15 years

(c) 20 years (d) 25 years

(e) None of these

Sol. (d) $T = \frac{\overset{\text{times}}{\overset{\nearrow}{n-1}}}{R} \times 100$

$$= \frac{3-1}{8} \times 100$$

$$= \frac{2}{8} \times 100 = 25 \text{ years}$$

Alternate

Here, the ratio of the sum and the amount is 1: 3 Therefore, the ratio of the sum and the interest would be 1 : 2

Now, we have

Amount = 3

Principal = 1

Interest = 2

Rate = 8%

Time = ?

Note that the interest is $\left(\frac{2}{1} \times 100\right)\%$

= 200% of the sum.

Now, we get $8 \times t = 200$

$\therefore$ $t = \frac{200}{8} = 25$ years

9. A certain sum is invested for a certain time period. It amounts to Rs. 400 at 10% per annum.But when invested at 4% per annum, it amounts to Rs. 200. Find the time.

(a) 100 years (b) 75 years

(c) 50 years (d) 60 years

(e) None of these

Sol. (c) Assume Time = T years

According to the question,

$$P\left(1+\frac{10t}{100}\right) = 400 \quad \text{.....(i)}$$

$$P\left(1+\frac{4t}{100}\right) = 200 \quad \text{.....(ii)}$$

From (i) and (ii)

$100 + 10t = 200 + 8t$

$2t = 100$

$t = 50$ years

10. Ramesh borrows Rs.7000 from a bank after 3 years he returns Rs.3000 and after 5 years by returning Rs.5450 closes the account. Find the rate of interest :

(a) 5 % (b) 4%

(c) 2% (d) 6%

Sol. (a) Actual P = Rs.7000

Total money returned = Rs.8450

S.I. = Rs.1450

SI of 3 years on 7000 will be Equal to SI of 1 year on 21000

SI of 2 years on 4000 will be Equal to SI of 1 year on 8000

21000 + 8000 = 29000

$$\frac{29000 \times R \times 1}{100} = 1450$$

R = 5 %

11. A sum was put on SI at a certain rate for 3 years. Had it been put at 4% higher rate, it would have fetched Rs. 600 more, Find the sum.

(a) Rs. 5000 (b) Rs. 4000

(c) Rs. 6000 (d) Rs. 3000

(e) None of these

Sol. (a) Extra Interest = 4 × 3 = 12%

$$\text{Hence, sum} = \frac{600}{12} \times 100$$

= Rs. 5000

12. A certain sum of money amounts to Rs. 550 in 3 years and to Rs. 650 in 4 years. Find the sum.

(a) Rs. 250 (b) Rs. 300

(c) Rs. 150 (d) Rs. 350

(e) None of these

Sol. (a) Amount for 3 years = Rs. 550

Amount for 4 years = Rs.650

SI for 1 year = Rs.100

Then, SI for 3 years = 300

Therefore, sum 550 – 300

Sum = Rs. 250

13. A sum was put at SI at a certain rate for 4 years. Had it been put at 5% lower rate, it would have fetched Rs. 100 less. Find the sum.

(a) Rs. 500 (b) Rs. 5000

(c) Rs. 400 (d) Rs. 4000

(e) None of these

Sol. (a) Accoding to the question,

Rs. 100 is (4 × 5=) 20% of the sum.

$$\text{Hence, sum} = \frac{100 \times 100}{20} = \text{Rs. } 500$$

14. Anish borrowed Rs. 15000 at the rate of 12% and another amount at the rate of 15% for two years. The total interest paid by him was Rs. 9000. How much did he borrow?

(a) Rs. 32000 (b) Rs. 33000

(c) Rs. 30000 (d) Rs. 63000

(e) None of these

Sol. (b) Here,

$$\frac{15000 \times 12 \times 2}{100} + \frac{x \times 15 \times 2}{100} = 9000$$

$$3600 + \frac{3}{10}x = 9000$$

$$x = \frac{(9000-3600) \times 10}{3}$$

$$= \frac{5400 \times 10}{3} = \text{Rs. } 18000$$

Hence the total borrowed amount=15000+18000=Rs. 33000

15. At a certain rate of simple interest Rs. 400 amounted to Rs. 460 in 3 years. If the rate of interest is decreased by 3%, what will be the amount after 3 years?

(a) Rs. 424 (b) Rs. 484

(c) Rs. 242 (d) Rs. 484

(e) None of these

Sol. (a) S.I = Rs. 400 $\xrightarrow[3\%]{3\text{ years}}$ 460 (amount)

Interest = $\frac{400 \times 9\%}{100}$ = Rs. 36

New amount required = 460 – 36 = Rs. 424

Alternate

The required new amount

= 460 – (3 × 3)% of 400

= 460 –36 = Rs. 424

16. Rs. 1,200 amounts to Rs. 1,632 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 1%, it would amount to how much?
(a) Rs. 1635 (b) Rs. 1644
(c) Rs. 1670 (d) Rs. 1680
(e) None of these

Sol. (d) Rs. 1200 $\xrightarrow[+1\%]{4\text{ years}}$ Rs.1632

Interest = 1200 × (4×1)%

= Rs.48

The required new amount

= 1632 + 48 = Rs. 1680

Alternate

The required new amount

= 1632 + (4 × 1)% of 1200

= 1632 + 48 = Rs. 1680

17. The simple interest on a sum of money will be Rs. 150 after 4 years. In the next 4 years principal becomes 5 times, what will be the total interest at the end of the 8th year?
(a) Rs. 950 (b) Rs. 850
(c) Rs. 900 (d) Rs. 860
(e) None of these

Sol. (c) In 4 Years

P ® Rs. 150

In next four Years

Principal = $\overbrace{5 \times 150}$

= Rs.750

Total Interest at the end of 8 years = 750 + 150 = Rs. 900

Alternate

Total interest at the end of 8 years

= 150 + 5 × 150 = Rs. 900

18. The simple interest on a sum of money will be Rs. 225 after 3 years. In the next 5 years principal becomes 3 times what will be the total interest at the end of the 8th year?
(a) Rs. 1250 (b) Rs. 1330
(c) Rs. 1360 (d) Rs. 1350
(e) None of these

Sol. (d)

Sum	Time	Interest
P	3 years	Rs. 225
P	1 year	Rs. 75
3P	1 year	Rs. 225
3P	5 years	Rs. 1125

Hence the total interest at the end of 8 years would be 225 + 1125 = Rs. 1350

19. A sum of Rs. 1521 is lent out in two parts in such a way that the interest on one part at 10% for 5 years is equal to that on another part at 8% for 10 years. Find the two sums.
(a) Rs. 926, Rs. 595
(b) Rs. 906, Rs. 615
(c) Rs. 916, Rs. 605
(d) Rs. 936, Rs. 585
(e) None of these

Sol. (d) Total → 1521

$P_1 \times 10\% \times 5$ $P_2 \times 8\% \times 10$

$\frac{P_1}{P_2} = \frac{8}{5}$

13 Units = Rs. 1521

1 Unit = Rs.117

P_1 ® 8 × 117 = Rs. 936

P_2 ® 5 × 117 = Rs. 585

20. A sum of money becomes two times at the simple interest rate of 2% per annum. At what rate per cent will it become five folds?
(a) 10% (b) 8%
(c) 6% (d) 9%
(e) None of these

Sol. (b) $T = \frac{n-1}{R} \times 100$ (n: times) $= \frac{2-1}{2} \times 100$

T = 50 years

$R\% = \frac{5-1}{50} \times 100 = 8\%$

21. A certain sum of money amounts to Rs. 5000 in 5 years at 10% per annum. In how many years will it amount to Rs. 6000 at the same rate?
(a) 8 years (b) 6 years
(c) 10 years (d) 9 years
(e) None of these

Sol. (a) Here the amount = Rs. 5000 is (100 + 5 × 10)% of the sum. Therefore, the amount = Rs. 6000 would be $\left(\frac{150}{5000} \times 6000\right)$ = 180% of sum where interest is equal to 80% of the sum Thus we get 10 × t = 80

□ t = 8 years

22. What principal will amount to Rs. 560 in 3 years at rate of 4 percent per annum simple interest?
(a) Rs. 540 (b) Rs. 500
(c) Rs. 550 (d) Rs. 560
(e) None of these

Sol. (b) Total interest = (100 + 3 × 4)%

Hence, sum = $\frac{560 \times 100}{112}$ = Rs. 500

23. A person lent a certain sum of money at 4% simple interest, and in 5 years the interest amounted to Rs. 520 less than the sum lent. Find the sum lent.
(a) Rs. 600 (b) Rs. 650
(c) Rs. 700 (d) Rs. 750
(e) None of these

Sol. (b) Here Rs. 520 is (100 – 4 × 5)% of the sum.

Hence sum = $\frac{520 \times 100}{80}$

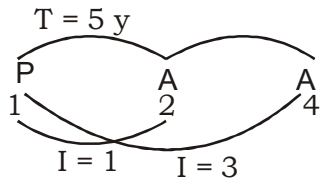
= Rs. 650

24. A sum of money double itself in 5 years. It will become 4 times itself in
(a) 10 years (b) 12 years
(c) 15 years (d) 20 years
(e) None of these

Sol. (a) $\frac{T_1}{T_2} = \frac{n_1 - 1}{n_2 - 1}$

$\frac{T_1}{5} = \frac{4-1}{2-1}$

T_1 = 15 years



1` ® 5 years

–

3 ` ® 15 years Ans

25. The simple interest on Rs. 1250 will be less than the interest on Rs. 1400 at 3% simple interest by Rs. 45. Find the time.

(a) 10 years (b) 9 years

(c) 8 years (d) 6 years

(e) None of these

Sol. (a) $\frac{1400' 3' t}{100}$

$- \frac{1250' 3' t}{100} = 45$

$\frac{4200t - 3750t}{100} = 45$

450t = 4500

t = 10 years

26 The difference in simple interests on a certain sum at 4% per annum for 3 years and at 5% per annum for 2 years is Rs. 50. Find the sum.

(a) Rs. 5000 (b) Rs. 4000

Exercise

1. ` 3600 was lent out on simple interest at $6\frac{1}{4}\%$ per annum. What will be the amount after $2\frac{1}{3}$ years?
   (a) ` 525 (b) ` 4,025
   (c) ` 4,125 (d) ` 4,000
2. Praveen deposited ` 5,000 in a post office on 5th January 1999. And he withdraw the total amount on 31st May of the same year. How much interest will he receive at 5% rate of simple interest?
   (a) ` 125 (b) ` 100
   (c) ` 112.5
   (d) None of these
3. Rakesh Yadav took ` 7500 loan at a certain rate of simple interest per annum and ` 4500 at 1% more. After three years he paid `1575 as simple interest. Find at what rate did he take ` 4500 loan?
   (a) $6\frac{1}{4}\%$ (b) $6\frac{2}{3}\%$
   (c) 5% (d) 6%
4. Bhuvnesh lent out ` 10800. A part of the amount was lent at 8% per annum and rest at 10% rate of simple interest per annum. If after two years he has gained ` 1908 as interest, find the sum of money on two different Rates he lent out.
   (a) ` 6300, 4500
   (b) ` 4500, 6300
   (c) ` 4000, 6800
   (d) ` 6800, 4000
5. ` 12000 was divided into two parts and first was lent out at 8% per annum rate of simple interest for 5 years and the other part was lent out at 10% per annum rate of simple interest for 4 years. If the interest on first part is thrice that of the second part, find the difference between two parts–
   (a) ` 5,000 (b) ` 4,800
   (c) ` 6,000 (d) ` 4,200
6. Rohit deposited 12,600 in a bank at 8% per annum and ` 4,200 at 6% per annum in another bank. After one year at what effective rate did he get his return on the whole amount he invested?
   (a) 7% (b) 8.25%
   (c) 7.5% (d) 7.75%
7. A certain amount becomes ` 1200 in 6 years and `1350 in 9 years at certain rate of simple interest. Find the rate of simple interest-
   (a) $5\frac{1}{2}\%$ (b) $5\frac{5}{9}\%$
   (c) $6\frac{1}{4}\%$
   (d) None of these
8. A certain amount becomes ` 30,000 in 8 years. If the simple interest is half of the principal amount, find the rate of interest and the amount.
   (a) $6\frac{1}{4}\%$, 24,000
   (b) 6%, 20,000
   (c) $6\frac{1}{4}\%$, 20,000
   (d) $6\frac{2}{3}\%$, 20,000
9. A certain amount becomes ` 11600 at $7\frac{1}{2}\%$ per annum in 6 years. How much would be the amount if it was lent out at 10% for 6 years?
   (a) ` 12,000 (b) ` 14,400
   (c) ` 13960 (d) ` 12,800
10. Pawan has ` 8000. He lent out ` 2,000 at 5% per annum ` 2,500 at 10% per annum and the remaining at r% per annum. He found that he got a return of 8% on the whole amount. Find the value of r.
    (a) $8\frac{1}{3}\%$ (b) $8\frac{2}{7}\%$
    (c) $8\frac{2}{5}\%$
    (d) None of these
11. Rakesh Yadav lent out his $\frac{1}{3}$ amount at 7% per annum $\frac{2}{5}$ amount at 10% per annum and the rest at 12% per annum. If after two year his income is `1430 find the amount he lent out :
    (a) 8,000 (b) 7500
    (c) 7200
    (d) None of these
12. `19400 is divided into two parts. First part is lent out at 8% per annum for 5 years and the other part is lent out at 4% per annum for 9 years. If the ratio of simple interest recieved on two parts is 3 : 7. Find the amount of second part :
    (a) ` 5,400 (b) `14000
    (c) ` 9700
    (d) None of these
13. An amount of `18600 is divided into three parts and these parts are lent out for 2 years, 4 years and 5 years respectively. If the rate of simple interest is 10% p.a., then the amount of all 3 parts become same. Find the three parts :
    (a) ` 5, 600, ` 6,000, ` 7,000
    (b) ` 4500, ` 6400, ` 7700
    (c) ` 7,000, ` 6,000, ` 5600
    (d) ` 7700, ` 6400, ` 4500
14. Three sums *x, y* and *z* are such that y is simple interest of x and *z* is the simple interest of y. If in both the conditions time

and rate of interest are same then find a relation between x, y and z.
(a) $z^2 = xy$ (b) $x^2 = yz$
(c) $y^2 = xz$
(d) None of these

15. Shiv lent out a certain sum at 5% per annum and 6 months later he lent out the same sum at 6% per annum. After a certain time shiv got Rs. 4600 total amount from each. How much money did he lend each time?
(a) ` 4200 (b) ` 4000
(c) ` 3600 (d) ` 3800

16. A man bought a bike and paid Rs.15,000 instantly. He promised that he would pay the rest money in two years 13920 with interest and the rate of interest being 8%. Find the cost of the bike.
(a) 30,000 (b) 25,000
(c) 28920 (d) 27,000

17. Bhuvnesh lent out a certain amount at 6% per annum for 2 years and another at 7% per annum for the same time and after the completion of the period. He got ` 2478 as interest. If one-fourth of the first amount is equal to one-fifth of the second amount. Find the total amount he lent out–
(a) ` 19900 (b) ` 19100
(c) ` 18900 (d) ` 18100

18. Rohit lent out a certain amount for some years. He lent it at 7% per annum for the first 3 years, at 9% for the next 4 years and for the rest time at 4% per annum. If at the end of 12 years he got ` 2772 as simple interest on the amount, find the amount he lent out.
(a) ` 3,000 (b) ` 4,000
(c) ` 3500 (d) ` 3600

19. Bhuvnesh took a loan of ` 7000 at simple interest. And further took a loan of ` 3000 after 3 years. After 5 years of second loan he paids Rs.4615 as interest and closed his account. Find the rate of interest.
(a) 5.5% (b) 6.5%
(c) 7.5% (d) 7.15%

20. A certain amount was taken as loan at 6% per annum loan. In the first year Rs.6800 was paid back and the rest money was charged with 5% p.a. . If the interest for second year is $\frac{11}{20}$ of the interest of Ist year, then find the amount taken on loan.
(a) ` 20,000 (b) ` 17,000
(c) `17500 (d) `16000

21. A certain amount at certain rate of simple interest for certain time gives a certain interest. The amount is increased by 20%, rate is made $\frac{2}{3}$ of the previous and time is made $\frac{6}{5}$ of the previous. In this way the simple interest received is ` 2400. What was the interest received in the first condition?
(a) ` 3,000 (d) ` 24,00
(c) ` 2500
(d) None of these

22. ` 30,000 is paid back in three annual installments. If the interest on the rest of the money at 4% added to each installment, find all three installments.
(a) 11200
(b) 11200, 10400, 10200
(c) 11200, 10800, 10400
(d) None of these

23. A certain amount becomes 4 times at 8% per annum. At what rate it will become 10 times in the same time?
(a) 25% (b) 27.5%
(c) 24% (d) 30%

24. The interest of what amount at 5% per annum for $3\frac{1}{2}$ years will be equal to the interest of Rs.1400 at $2\frac{1}{2}\%$ per annum for 4 years?
(a) ` 100 (b) ` 960
(c) ` 740 (d) ` 800

25. A certain amount becomes $\frac{29}{25}$ times at simple interest. If the numerical value of interest rate and time be the same, find the rate of interest.
(a) 4% (b) 5%
(c) 5.5% (d) 4.5%

26. A certain amount becomes Rs.3000 in 5 years. If the simple interest received is one-fourth of the amount find the rate of interest and the amount.
(a) 5%, ` 2500
(b) 6%, ` 2400
(c) 5%, ` 2600
(d) None of these

27. A certain amount becomes ` 3000 at 4% per annum in $6\frac{1}{4}$ years. What will be amount at $6\frac{2}{3}\%$ per annum in $5\frac{1}{2}$ years?
(a) ` 3600 (b) ` 3050
(c) ` 3080 (d) ` 3280

28. Bhuvnesh deposited ` 8000 in a bank and ` 4500 in the next year. If after 5 years he received ` 3480 as simple interest, find the rate of interest.
(a) 7.5% (b) $6\frac{1}{4}\%$
(c) 6% (d) $5\frac{1}{2}\%$

29. Jitu has ` 20,000 out of which he lends ` 4000 at 7% per annum, ` 6000 at 8% per annum, 5000 at 10% per annum and the remaining at r%. If after calculation he get to know that he had gained 12% income on the whole amount, find the value of r.
(a) 20% (b) 25%
(c) 22.8% (d) 24%

30. Rakesh Yadav had ` 25000 out of which he lent out some amount at 8% and remaining at 11%. After four year he got Rs.9080 as interest. Find the amount lent out at each rate–
(a) 9000 at 8%, 16000 at 11%
(b) 12500 at 8%, 12500 at 11%

(c) 15000 at 18%, 1000 at 11%
(d) 16000 at 8%, 9000 at 11%

31. Bhuvnesh took a loan of Rs. 10,000 from his friend at 12% per annum rate of simple interest for 5 years. He gave his friend a watch and a camera as interest. The cost of these two articles is in the ratio of 7 : 23. Find the cost of the camera
(a) ` 6900 (b) ` 3450
(c) ` 4600 (d) ` 4400

32. Radha lent out some money at 8.37%. Per annum rate of simple interest for $2\frac{1}{2}$ years. She calculated that had she given it at 1.37% less, she would have received ` 6850 less. What amount he lent out?
(a) 1,00, 000 (b) 2,40,000
(c) 2,00,000 (d) 1,40,000

33. Rakesh Yadav and Bhuvnesh invested ` 5400 and ` 7200 for 4 years and 3 years respectively. If the total simple interest received by both of them is ` 3456 and the rate charged by them is in the ratio of 3 : 5, At what rate Bhuvnesh invested the money.
(a) 6% (b) 7.5%
(c) 10% (d) 12.5%

34. Rakesh Yadav and Kareena lent out ` 14400 and ` 16200 for $3\frac{3}{8}$ years and 3 years respectively at simple interest. After the completion of time. Kareena received `1458 more than that of Rakesh. Find the difference of rates at which both lent out the money.
(a) 3% (b) 5%
(c) 2.5%
(d) Can't be determind

35. Manoj lent out ` 5650 for $3\frac{1}{2}$ years at simple interest and after the completion of time he received an amount of ` 6441. If he increases the rate of interest he will get ` 8418.50. Find how much he increases the rate of interest ?
(c) 8% (b) 14%
(c) 9% (d) 10%

36. X lent out a part of ` 22000 to Y and the rest to Z. The ratio of rates at which he lent to X and Y was 4 : 5 and the ratio of time was $2\frac{1}{2} : 3\frac{1}{2}$ If both paid the same interest, find the amount taken on loan by each of them.
(a) 8,000, 14,000
(b) 14000, 8000
(c) 10, 000, 12,000
(d) 12,000, 10,000

37. Parveen divided ` 44000 in two parts and lent out to two persons at 7% and 10% for 4 years and 2 years respectively. The interest received by them was in the ratio 4 : 5 How many rupees did parveen lend ro first person?
(a) 16000 (b) 22000
(c) 28000
(d) None of these

38. ` 2250 was divided into two parts and first was lent out at $4\frac{1}{2}$% per annum for 3 years while the other at 6% per annum for $1\frac{4}{5}$ years. It same interest is received in both the investments. Find the difference between two parts lent out.
(a) 200 (b) 450
(c) 350 (d) 250

39. I lent out a certain amount at certain rate of simple interest for certain time and I got ` 1250 as interest. If I lent out 40% more amount for $\frac{4}{7}$ time at $\frac{3}{2}$ rate of interest, what would be my interest received?
(a) 2000 (b) 1000
(c) 1750 (d) 1500

40. ` 44900 is divided among four people. If they pay equal amount (principal amount + interest) after 2 years, 4 years, 6 years and 10 years at 10% per annum rate of simple interest. Find the difference of the maximum and the minimum share they received.
(a) ` 17665.57 (b) ` 21600
(c) ` 5600 (d) ` 8600

41. Bhuvnesh took a loan of ` 50,000 at $6\frac{1}{2}$% per annum for three years. And he also lent out ` 60,000 at 7% for $3\frac{1}{2}$ years. In this way whatever he earned he invested it on purchaing a Fan, a table and a calculater the costs of which were in ratio 28 : 15 : 7. Find the cost of the fan, the table, and the calculater each.
(a) ` 2800,` 1500, ` 700
(b) ` 2872, ` 1515, ` 707
(c) ` 2727, ` 1439, ` 639
(d) ` 2772, ` 1485, ` 693

42. ` 33220 was divided among three friends. If after 4 years 5 years and 10 years respectively they paid same interest amount, interest rate being 7% per annum, Find the share of each of them.
(a) 6040, 12080, 15100
(b) 15100, 12088, 6040
(c) 15100, 12080, 6004
(d) None of these

43. A lent out 4800 to B at 8% per annum rate of simple interest for 2 years. B lent the same amount to C at 3% more for the same time period. If after the completion of time B paid back to A and C paid back to B, Find the profit of B.
(a) ` 144 (b) ` 288
(c) ` 320 (d) ` 324

44. Two same amounts were borrowed for the same time at 9% per annum and 8% per annum rate of simple interest repectively. The first amount was taken back 6 months ear-

lier than second and in this way the total amount paid in both the conditions was ` 17680. Find each amount and also find the time of their borrowing ?

(a) ` 14000, 5 year $5\frac{1}{2}$ year

(b) ` 13000, $4\frac{1}{2}$ years, 5 year

(c) ` 13000, 4 years, $4\frac{1}{2}$ year

(d) None of these

45. Rohit bought an old car at the down payment of ` 30,000. He promised that he would pay the rest amount after three years at 8% interest rate by paying ` 49600. At what cost did he buy the car.
(a) 60,000 (b) 70,000
(c) 72,000 (d) 68,000

46. A certain amount was lent out at 8% per annum rate of simple interest and after one year ` 4680 was paid back and the interest rate on the remaining sum was made 7% per annum. If the interest of second year is $\frac{3}{4}$ of the first year's interest, find the amount lent out.
(a) 20,000 (b) 18,500
(c) 19,100 (d) 21,000

47. The time taken by ` 1500 to become ` 1680 at 4% per annum is same as the time taken by a certain amount to become ` 1150 at 5% per annum. Find the certain amount
(a) ` 900 (b) ` 980
(c) ` 1000 (d) ` 1020

48. X, Y and Z are three friends. X took loan from Y and Z of ` 1200 and 1600 at 5% per annum and at 4% per annum respectively for 3 years. After the completion of the time X returned the amount with interest to Y and Z. Being a friend Y and Z returned 1% of the interest they received from X. Find the actual interest X paid to Y and Z.
(a) ` 372 (b) ` 367.82
(c) ` 368.28 (d) ` 363.36

49. Rakesh Yadav lent out 12000 in two parts one at $7\frac{1}{2}\%$ and the other at $9\frac{1}{2}\%$ per annum. After three years each received ` 1000 as interest. Find the difference between two parts.
(a) ` 0 (b) ` 1000
(c) ` 2000 (d) ` 1500

50. A man had ` 30,000. He invested ` 10,000 at 6% per annum in a post-office and ` 8,000 at 4% per annum in a bank. If he wants to earn `1880 as interest at what rate the rest amount should be lent out ?
(a) 10% (b) 8.5%
(c) 7.5% (d) 8%

each year?

some simple interest, if sum is increased by 20% and rate of interest is 2/3 of previous one but time is 6/5, if gives Rs. 2400 as simple interest. Find the previous simple interest.
(a) Rs. 2550 (b) Rs. 3500
(c) Rs. 2500 (d) Rs. 2600

ANSWER KEY

1. (c)	6. (c)	11. (b)	16. (d)	21. (c)	26. (d)	31. (c)	36. (b)	41. (d)	46. (d)
2. (b)	7. (b)	12. (b)	17. (c)	22. (c)	27. (d)	32. (c)	37. (a)	42. (d)	47. (c)
3. (c)	8. (c)	13. (c)	18. (d)	23. (c)	28. (c)	33. (c)	38. (d)	43. (b)	48. (c)
4. (a)	9. (d)	14. (c)	19. (b)	24. (d)	29. (c)	34. (a)	39. (d)	44. (c)	49. (c)
5. (c)	10. (b)	15. (b)	20. (b)	25. (a)	30. (d)	35. (d)	40. (c)	45. (b)	50. (d)

Solution

1. (c) P = `3600, $r = \frac{25}{4}\%$,

$t = \frac{7}{3}$ years

so, $SI = \frac{p' r' t}{100}$

$= \frac{3600}{100} \times \frac{25}{4} \times \frac{7}{3} =$ ` 525

Hence the total amount A
= P + SI = 3600 + 525
= `4125

Alternatively

$SI = r \times t\% = \frac{25}{4} \times \frac{7}{3} = \frac{175}{12}\%$

Total amount A = P + A

$= 100\% + \frac{175}{12}\% = \frac{1375}{12}\%$

$= \frac{1375}{12}, \frac{3600}{100} =$ ` 4125

2. (b) P = `5,000, r = 5%

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

So, $SI = \frac{5,000' 5' 2}{100' 5} =$ `100

Hence praveen got ` 100 as interest from the post office.

3. (c) Let ` 7500 was taken at r% so ` 4500 was taken at (r+1)%
Now,

Principal → 7500 (r%) 4500 ((r+1)%)

Interest → 3r% + 3(r+1)%

→ 225r + 135r + 135 = 1575

So, 225r + 135r = 1575 – 135

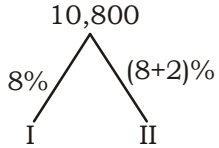
360r = 1440

Þ $\boxed{r = 4\%}$

The rate at which 4500 is taken = 4% + 1% = 5%

[**Note**: Here we note that Interest = rate × time%]

4. (a) S.I for two years = `1908
S.I for one year = `954
Now,



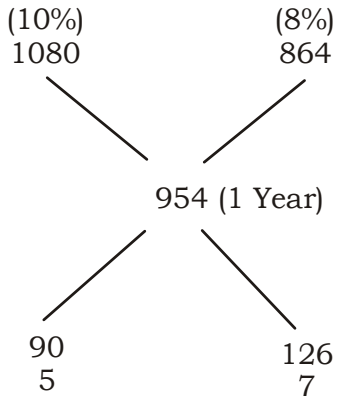
Interest of one year

Þ 8% of whole + 2% of II = 954

$\frac{8 \times 10800}{100}$ + 2% of II = 954

2% of II = 954 – 864
2% of II = 90
100% of II = `4500
II = ` 4500
Þ I = 10800 – 4500
I = ` 6300

Alternate



Q Total (5 + 7 = 10800)

\ $5 = \frac{10800}{12} \times 5 = 4500$

$7 = \frac{10800}{12} \times 7 = 6300$

5. (c) S.I on the first part = 5×8%
= 40% of I
S.I on the second part
= 4×10% = 40% of II
But, according to the question,
40% I = 3 × 40% II

$$\frac{I}{II}=\frac{3}{1}$$

So, the required difference (I-II)

$$=\frac{(3-1)}{4}\times 12{,}000$$

$$=\frac{2}{4}\times 12{,}000 = ₹\ 6{,}000$$

6. (c) Amount received from the first bank

$$=8\times\frac{12600}{100}\times 1=₹\ 1008$$

Amount received from the second bank

$$=6\times\frac{4200}{100}\times 1=₹\ 252$$

Total amount received

= 1008 + 252 = ₹1260

Hence effective annual rate on the whole amount

$$=\frac{1260}{(12600+4200)}\times 100$$

$$=\frac{1260}{16800}\times 100 = 7.5\%$$

7. (b) S.I of three years = 1350 – 1200 = ₹150

S.I of 6 years = ₹300

Principal = Amount – S.I

Hence the amount

= 1200 – 300 = ₹ 900

We know that S.I of 1 years = ₹ 50

Hence the rate of interest

$$=\frac{50}{900}\times 100=5\frac{5}{9}\%$$

8. (c) Since simple interest is half of the amount
Hence S.I. = 50% = r × t%
∴ r × 8 = 50%

Rate of interest r = $6\frac{1}{4}\%$

Again if the principal be p then,

$$p+\frac{p}{2}=30{,}000$$

Hence the principal p
= ₹20,000

9. (d) Interest in first condition

$$=7\frac{1}{2}\times 6\%$$

$$=\frac{15}{2}\times 6\% = 45\%$$

Hence total amount in first condition = 145%

Interest in second condition = 10 × 6% = 60%

Total amount in second condition = 160%

But

145% ® 11600

$$160\% \text{ ® } \frac{160}{145}\times 11600$$

= ₹12,800

Hence the required amount
= ₹ 12,800

10. (b)

Principal
2000 + 2500 + 3500 = 8000
5% 10% r% 8%
100 + 250 + 35r = 640
Interest

∴ 35r = 640 – 350

35r = 290

Hence the required rate

$$=8\frac{2}{7}\%$$

11. (b) Interest received in two years = ₹1430

Interest received in one year = ₹ 715

Also, the interest of one year

$$=\frac{1}{3}\times 7\%+\frac{2}{5}\times 10\%+\frac{4}{15}\times 12\%$$

$$=\left(\frac{7}{3}+4+\frac{16}{5}\right)\%$$

Hence $\frac{143}{15}\%$ ® 715

$$100\% \text{ ® } \frac{15}{143}\times 100\times 715$$

= ₹ 7500

Hence required amount = ₹ 7500

12. (b) Simple interest on Ist part = 8 × 5% = 40%

Simple interest on IInd part = 4 × 9% = 36%

Now by question,

$$\frac{40\%\times I}{36\%\times II}=\frac{3}{7}$$

$$\frac{I}{II}=\frac{27}{70}$$

Hence the second part (II)

$$=\frac{70}{97}\times 19400=₹\ 14{,}000$$

13. (c) Let the three parts be A, B and C

Then

Part A becomes after 2 years
= (100 + 2 × 10)
= 120%
Part B becomes after 4 years
= (100 + 4 × 10)
= 140%
and part C becomes after 5 years
= (100 + 5 × 10) = 150%

Now by question,

A × 120% = B × 140% = C × 150% = K (let)

$$A : B : C = \frac{K}{120}:\frac{K}{140}:\frac{K}{150} = 35 : 30 : 28$$

$$A=\frac{35}{(35+30+28)}\times 18600=₹\ 7000$$

$$B=\frac{30}{(35+30+28)}\times 18600=₹\ 6{,}000$$

$$C=\frac{28}{(35+30+28)}\times 18600=₹\ 5{,}600$$

14. (c) Let the rate of interest be r% per annum and the time is t years.

Then, Interest on x = r × t of x

∴ $y = (r \times t) \times x\ \%$

$$\therefore \frac{y}{x} = r \times t\% \quad \ldots(i)$$

Interest on y = r × t% of y

$z = r \times t \times y\%$

$$\frac{z}{y} = r\times t\% \quad \ldots(ii)$$

by (i) and (ii) $\frac{y}{x}=\frac{z}{y}$

$$\boxed{y^2 = xz}$$

15. (b) Let the sum be 100% and he lent it for t years to the first and $\left(t-\frac{1}{2}\right)$ years to the second person.

The amount received from first person

= (100 + 5× t)%

and the amount received from second person

$$= \left[100+6\left(t-\frac{1}{2}\right)\right]\%$$

But by question,

$$100 + 5 \times t = 100 + 6\left(t-\frac{1}{2}\right)$$

$\therefore$ t = 3 years

Hence amount received from each person

= 100 + 5 × 3 = 115%

$$100 + 6 \times 2\frac{1}{2} = 115\%$$

or

115% ® `4600

$\therefore$ 100% ® ` 4000

Hence the sum lent to each person = ` 4000

16. (d) Interest on the remaining sum = 8 × 2% = 16%

By question,

116% ® 13920

$$100\% \text{ ® } \frac{100}{116}\times 13920 = 12000$$

So, the remaining cost

= `12000

Total cost of the bike

= 15,000+12,000 = ` 27,000

17. (c) Let the amounts be P_1 and P_2. Then

$$\frac{p_1}{4}=\frac{p_2}{5}$$

$$\frac{p_1}{p_2}=\frac{4}{5}$$

Take $p_1 = 4x$ $p_2 = 5x$

Interest for first = 6 × 2%

= 12%

Interest for second = 7 ×2

= 14%

But

12% of $4x$ + 14% of $5x$ = 2478

$$\frac{12' 4x}{100}+\frac{14' 5x}{100}=2478$$

$$\frac{118x}{100}=2478$$

x = 2100

Total amount lent out

= $4x + 5x = 9x$

= 9 × 2100 = `18,900

18. (d) Total interest = (3 × 7 + 4 × 9 + 5 × 4)%

= (21 + 36 + 20)% = 77%

But

77% ® 2772

$$100\% \text{ ® } \frac{100}{77}' 2772 = \text{ ` } 3600$$

Hence the amount lent out is ` 3600

19. (b) Let the rate of interest be r%

Total interest is given by 7000

$$\times \frac{3' r}{100} + 10000 \times \frac{5' r}{100} = 4615$$

210r + 500r = 4615

r = 6.5%

20. (b) Let the amount taken on loan = x.

Interest in the first year

$$= \frac{x' 6}{100}=\frac{6x}{100}$$

Total money in the first year

$$= \frac{106x}{100}$$

Money left for the next year =

$$\left[\frac{106x}{100}-6800\right]$$

Interest in the second year

$$= \frac{5}{100}, \left[\frac{106}{100}x-6800\right]$$

Now according to the question,

$$\frac{5}{100}, \left[\frac{106}{100}x-6800\right]$$

$$= \frac{11}{20}, \frac{6x}{100}$$

$$\left[\frac{106}{100}x-6800\right]=11' \frac{6x}{100}$$

$$\frac{106x-66x}{100}=6800$$

$$\frac{40x}{100}=6800$$

x = `17000

21. (c) Let the amount be x, rate be r% and time be t years

Interest received in the first case

$$SI_1 = \frac{x' r' t}{100} \quad \text{..... (i)}$$

But Now, P = $\frac{120}{100}x=\frac{6}{5}x$, R = $\frac{2}{3}r$, T = $\frac{6}{5}r$

So, the new interest

$$SI_2 = \frac{\frac{6}{5}, x' \frac{2}{3}r' \frac{6}{5}, t}{100}$$

$$= \frac{24}{25}, \frac{x' r' t}{100}$$

(From equation no (i))

$$SI_2 = \frac{24}{25}\times SI_1$$

$$\frac{SI_2}{SI_1} = \frac{24}{25}$$

$$\frac{2400}{SI_1}=\frac{24}{25}$$

$\therefore$ SI_1 = `2500

22. (c) Interest for the first year

$$= \frac{30,000' 4' 1}{100}=1200$$

The installment paid in the last of first year

$$= \left(\frac{1}{3}' 30,000+1200\right)$$

= `11200

The money left after one year = (30,000 – 10,000) = `20,000

Interest for the second year =

$$\frac{20,000' 4' 1}{100} = \text{`}800$$

The installment paid in the last of second year

$$= \left(\frac{1}{2}' 20,000+800\right)=10800$$

Now the money left after 2 year = `10,000

Interest in the third year

$= \frac{10,000 \times 4 \times 1}{100}$ = `400

The installment paid in the last of three year

= 10,000 + 400 = `10400

23. (c) The amount becomes 4 times this means the interest received = r × t% = 300%

8 × t% = 300%

$t = \frac{300}{8} = 37\frac{1}{2}$ years.

To make amount 10 times the interest = 900%

r × t% = 900%

$r \times 37\frac{1}{2} = 900\%$

$r = \frac{900 \times 8}{300} = 24\%$

24. (d) Let the amount be x then

Interest received on x = 5 × $3\frac{1}{2}\%$ = 17.5% of x

Interest received on 1400

$= 4 \times 2\frac{1}{2}\% = 10\%$

= ` 140

17.5% ® `140

100% ® $\frac{100}{17.5} \times 140$ = ` 800

Hence the amount is ` 800

25. (a) Let the rate of interest be r% and time be t years

The interest received

$= \frac{29}{25} - 1 = = \frac{4}{25} = 16\%$

r × t% = 16%

r × r% = 16% [t = r]

rate of interest

$\boxed{r = 4\%}$

26. (d) Let the amount be P and rate of interst be r% then

Interest received

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

But interest = r × t%

So, r × 5% = 25% [t = 5 years]

r = 5%

We know that $p + \frac{p}{4} = 3000$

$\frac{5p}{4} = 3000$

p = `2400

27. (d) Let the amount be p.

Interest received in first case

$= 4 \times 6\frac{1}{4}\% = 25\%$

Total amount in first case

= (100 + 25)% = 125% of p.

125% ® 3000

100% ® $\frac{100}{125} \times 3000$ = `2400

Hence P = ` 2400

Interest received in the second case

$= 6\frac{2}{3} \times 5\frac{1}{2}\%$

$= \frac{20}{3} \times \frac{11}{2}\% = \frac{110}{3}\%$

Total amount = $100 + \frac{110}{3}$

$= \frac{410}{3}\%$

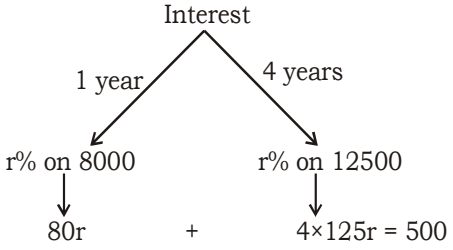
100% ® 2400

$\frac{410}{3}\%$ ® $\frac{410}{3 \times 100} \times 2400$

= 3280

Hence the required amount = ` 3280

28. (c) Let the rate be r% per annum



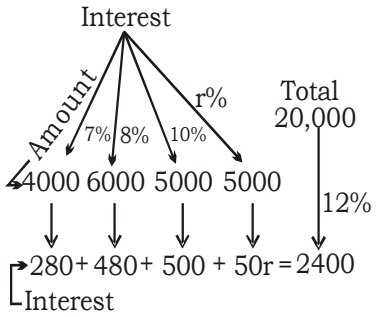
80r + 500r = 3480

580r = 3480

r = 6%

Hence the required rate = 6% per annum

29. (c)



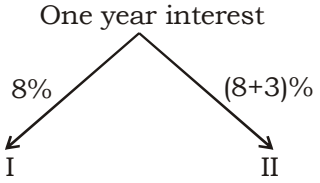
50r = 2400 – 1260

50r = 1140

$r = 22\frac{4}{5}\% = 22.8\%$

30. (d) Interest of four years = ` 9080

Interest of one year = ` 2270



Þ 8% of whole + 3% of II = 2270

$\frac{8 \times 25000}{100} + 3\%$ of II = 2270

3% of II = 2270 – 2000 = 270

100% of II = $\frac{100}{3} \times 270$

II = 9000

Hence I = 25000 – 9000

= 16000

So, he lent out ` 16000 at 8% and ` 9000 at 11%

Alternatively

One year interest

$= \frac{9080}{4} = 2270$

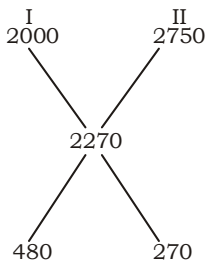
One year interest if the whole amount is lent out at 8%

$= \frac{8 \times 25000}{100} = 2000$

One year interest of the whole amount is lent out at 11%

$= \frac{11 \times 25000}{100} = 2750$

Now by alligation rule,



16 : 9 = 25

×1000 ×1000 ×1000

16000 9000 25000

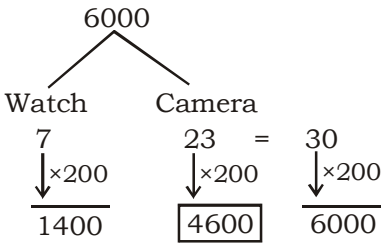
Hence the amount at 8% = `16000 and the amount at 11% = `9000.

31. (c) The amount of interest

$= 10{,}000 \times \frac{12 \times 5}{100}$

= `6000

Now,



Hence, the cost of camera= ` **4600**

32. (c) Difference of interest in $\frac{5}{2}$ years = 6850

Difference of interest in 1 year = $\frac{2}{5} \times 6850$ = ` 2740

Hence,

1.37% ⟶ 2740

1% ⟶ $\frac{2740}{1.37}$ = 2000

100% ⟶ 100×2000

= `2,00,000

33. (c) Let the rate charged by Rakesh and Bhuvnesh are 3r% and 5r% respectively.

Then interest received by Rakesh

$= \frac{5400 \times 3r \times 4}{100} = 648r$

and, interest received by Bhuvnesh

$= \frac{7200 \times 5r \times 3}{100} = 1080r$

But by question, $648r + 1080r = 3456$

$1728r = 3456$

$r = 2$

Hence the rate charged by Bhuvnesh = 5r%

= 10%

34. (a) Let Rakesh lent out at r% and Kareena at k%.

Then, Interest received by Rakesh

$= \frac{14400 \times r}{100} \times \frac{27}{8} = 486\,r$

Interest received by Kareena

$= \frac{16200 \times k \times 3}{100}$

= 486 k

Difference between the interest = 1458 (Given)

486k – 486r = 1458

486 (k – r) = 1458

Hence, the required difference (k – r) = 3%

35. (d) Interest received in $3\frac{1}{2}$ years = 6441–5650

= ` 791

Interest received in 1 year

$= \frac{791}{7} \times 2 = 113 \times 2 = 226$

Rate of interest = $\frac{226}{5650} \times 100$

= 4%

Interest received in the second case

= 8418.50 – 5650 = 2768.50

Rate of interest

$= \frac{2 \times 2768.50}{7 \times 5650} \times 100 =$ 14%

Hence the increment in the rate of interest

= (14 – 4) = 10%

36. (b) Ratio of rates = 4 : 5

Ratio of time = $2\frac{1}{2} : 3\frac{1}{2}$ = 5 : 7

Let rate for y is 4r% and time be 5t years while rate for z is 5r% and time be 7t years.

Interest paid by y = $\frac{y \times 4r \times 5t}{100}$

Interest paid by z = $\frac{z \times 5r \times 7t}{100}$

But by question,

$\frac{y \times 4r \times 5t}{100} = \frac{z \times 5r \times 7t}{100}$

$\frac{y}{z} = \frac{7}{4}$

Hence amount taken by y

$= \frac{7}{(7+4)} \times 22000$ = `14000

Amount taken by z

$= \frac{4}{(7+4)} \times 22000$ = `8000

37. (a) Let he lent A to first person and B to second.

By question, $\frac{\frac{A \times 7 \times 4}{100}}{\frac{B \times 10 \times 2}{100}} = \frac{4}{5}$

$\frac{7\,A}{5\,B} = \frac{4}{5} \Rightarrow \frac{4}{7}$

Amount given to first person A

$= \frac{4}{11} \times 44000$ = `16000

38. (d) Let two parts be A and B respectively.

Then by question,

$$A \times \frac{9}{2} \times \frac{3}{100} = B \times \frac{6}{100} \times \frac{9}{5}$$

$$\frac{A}{B} = \frac{4}{5}$$

Q A + B = 9 = 2250 and A – B = 1

Hence the required difference (B – A)

$$= \frac{(5-4)}{(5+4)} \times 2250 = \frac{1}{9} \times 2250 = ` 250$$

39. (d) Let the initial amount is P and rate of interest be r% per annum and time is t years.

Then interest received

$$= \frac{p \times r \times t}{100} = 1250 \quad \text{.... (i)}$$

Now new amount = $\frac{140}{100}$P = $\frac{7}{5}$P

New rate = $\frac{3}{2}$r

New time = $\frac{4}{7}t$

New interest received

$$= \frac{\frac{7}{5}p \times \frac{3}{2}r \times \frac{4}{7}}{100} = \frac{6}{5} \times \frac{p \times r \times t}{100}$$

(From equation no.(i))

$$= \frac{6}{5} \times 1250 = 1500$$

Hence the required interest amount = ` 1500

40. (c) Let the four persons get A, B, C and D amounts respectively.

Then by question,

$$A \times \frac{120}{100} = B \times \frac{140}{100} = C \times \frac{160}{100} = D \times \frac{200}{100} = K \text{ (Let)}$$

A : B : C : D

$$= \frac{K}{12} : \frac{K}{14} : \frac{K}{16} : \frac{K}{20}$$

(LCM of 12, 14, 16, 20 = 1680)

= 140 : 120 : 105 : 84

Required difference

$$= \frac{(140-84)}{(140+120+105+84)} \times 44900$$

$$= \frac{56}{449} \times 44900 = ` \mathbf{5600}$$

41. (d) Interest paid by Bhuvnesh

$$= 50,000 \times \frac{13}{2} \times \frac{3}{100} = 9750$$

Interest received by Bhuvnesh

$$= 60,000 \times \frac{7}{100} \times \frac{7}{2} = 14700$$

Profit of Bhuvnesh

= 14700 – 9750 = 4950

Cost of a fan

$$= \frac{28}{(28+15+7)} \times 4950$$

$$= ` 2772$$

Cost of a table

$$= \frac{15}{(28+15+7)} \times 4950$$

$$= ` 1485$$

Cost of a calculater

$$= \frac{7}{(28+15+7)} \times 4950 = ` \mathbf{693}$$

42. (d) By question,

$$A \times \frac{4 \times 7}{100} = B \times \frac{5 \times 7}{100}$$

$$= C \times \frac{10 \times 7}{100} = K \text{(Let)}$$

A : B : C

$$= \frac{K}{4} : \frac{K}{5} : \frac{K}{10}$$

= 5 : 4 : 2

Amount received by A

$$= \frac{5}{11} \times 33220 = ` 15100$$

Amount received by B

$$= \frac{4}{11} \times 33220 = ` 12080$$

Amount received by C

$$= \frac{2}{11} \times 33220 = ` 6040$$

43. (b) Interest paid by B = 8 × 2

= 16 %

Interest paid by C = (8 + 3)× 2 = 22%

Profit earned by B = (22 – 16) = 6%

Hence the required profit of B

$$= \frac{6 \times 4800}{100} = ` 288$$

44. (c) Let the second amount was borrowed for t years then the first amount was borrowed for $\left(t - \frac{1}{2}\right)$ years.

Interest paid on first = Interest on second

$$9 \times \left(t - \frac{1}{2}\right)\% = 8 \times t\%$$

$t = \frac{9}{2}$ years = $4\frac{1}{2}$ years

and $\left(t - \frac{1}{2}\right)$ = 4 years

Hence interest paid by each

= 9 × 4 = 36%

or 8 × $4\frac{1}{2}$ = 36%

Total amount = 136 %

But 136% → 17680

$$100\% \rightarrow \frac{100}{136} \times 17680$$

= 13000

Hence each amount borrowed was ` 13000.

45. (b) Let the remaining amount to be paid = x

Then interest in 3 years on x = 3 × 8 = 24%

Hence the amount become

= (100 + 24)% = 124%

But, 124% of x = 49600

$$100\% \text{ of } x = \frac{100}{124} \times 49600$$

$$\Rightarrow x = 40{,}000$$

Hence the cost at which Rohit bought the car

= 30,000 + 40,000 = `70,000

46. (d) Let the amount lent out was x

Amount after one year

$$= \frac{108}{100}x$$

Since, Interest of one year

$$= \frac{8}{100}x$$

Amount left after one year

$$= \frac{108}{100}x - 4680$$

Interest of the second year

$$= \frac{7}{100}\left(\frac{108}{100}x - 4680\right)$$

Now by question,

$$\frac{7}{100}\left(\frac{108}{100}x - 4680\right) = \frac{3}{4} \times \frac{8}{100}x$$

$$\Rightarrow x = \text{`}21{,}000$$

47. (c) Interest received on `1500
= 1680 – 1500 = `180

Interest percentage

$$= \frac{180}{1500} \times 100 = 12\%$$

But Interest percentage = $r \times t$%

So, $4 \times t = 12$

$\Rightarrow t$ = 3 years

Now let the certain amount be x.

interest received on it

= 3 × 5 = 15%

Total amount = (100 + 15)

= 115%

115% of x = 1150

$\Rightarrow$ 100% of x = 1000

Hence the certain amount is ` 1000.

48. (c) Interest paid to y

$$= \frac{1200 \times 5 \times 3}{100} = \text{`}180$$

Interest paid to z

$$= \frac{1600 \times 4 \times 3}{100} = \text{`}192$$

Total amount paid by x = 180 + 192

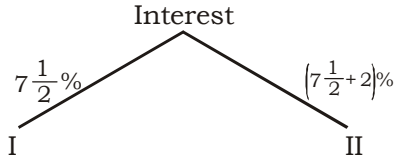
= ` 372

Total actual amount paid by x

$$= \frac{99}{100} \times 372 = \text{` } 368.28$$

49. (c) Interest received in one year

$$= \frac{3000}{3} = \text{`}1000$$



$\Rightarrow$ $7\frac{1}{2}$% of whole + 2% of II

= 1000

$\frac{15}{2} \times \frac{12000}{100}$ + 2% of II = 1000

900 + 2% of II = 1000

2% of II = 100

100% of II = 5000

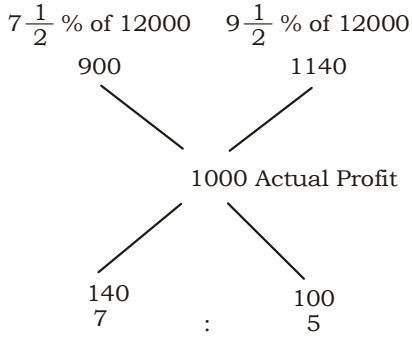
Hence second part = 5000

first part = 7000

Required difference

= 7000 – 5000 = ` 2000

Alternate



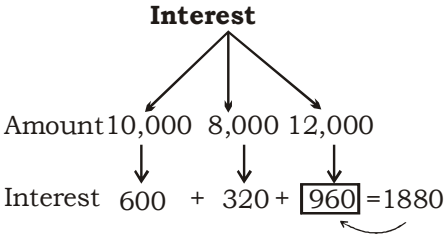
Q Total = 7 + 5 = 12 = 12000

\ 7 = 7000 and 5 = 5000

Required difference

= 7000 – 5000 = Rs. 2000

50. (d)



Interest received on 12000

= 1880 – 920 = 960

Hence the rate of interest

$$= \frac{960}{12000} \times 100 = 8\%$$