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Sahi Prep Hai Toh Life Set Hai

SIMPLE INTEREST

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Agenda

I Simple Interest

Concept + Theory + 9 solved examples → 70 Min

5-6 Question → 30 Min

Homework → 20 Question

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II nd class

(14-15) Question left → 45 min

Compound Interest

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SIMPLE INTEREST

R% of P

$\frac{R \cdot P}{100}$

P = Principal

R = Rate of Interest * By default it is annually

T = Time Period

$$\text{S.I.} = \frac{P \cdot R \cdot T}{100}$$

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Q1. (i) P = 20,000

R = 15% annum

T = 3 Years

S.I. = ?

$$S.I = \frac{20000 \cdot 15 \cdot 3}{100}$$

$$= 9000$$

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Q1. (ii) P = 45,000

R = 18% annum

T = 27 months

S.I. = ?

$$T = \frac{27}{12}^{9}_{4} \text{ years}$$

$$S.I = \frac{45000 \cdot 18 \cdot 9}{100 \quad 4/2}$$

$$= 18225$$

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73days → 1/5

146 days → 2/5

219days → 3/5

292days → 4/5

Q1. (iii) P = 12,000

R = 25% annum

T = 146 days

S.I. = ?

(If nothing is given by default, it is assumed as an ordinary year : Ordinary year = 365 days)

$$S.I = \frac{12000 \cdot 25 \cdot 146}{100 \quad 365} = 1200 \text{ Rs}$$

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Difference between Ordinary and Leap Year

eg 1728 ✓

Ordinary Year = 365 Days

eg 1864 ✓

Leap Year = 366 Days

(Any year which is divided by 4 is a leap year.
BUT, If it is a century year, then it has to divided by 400 to be a leap year.

eg 1900 ✗

eg 1900 not a leap year

1600 yes this is a leap year

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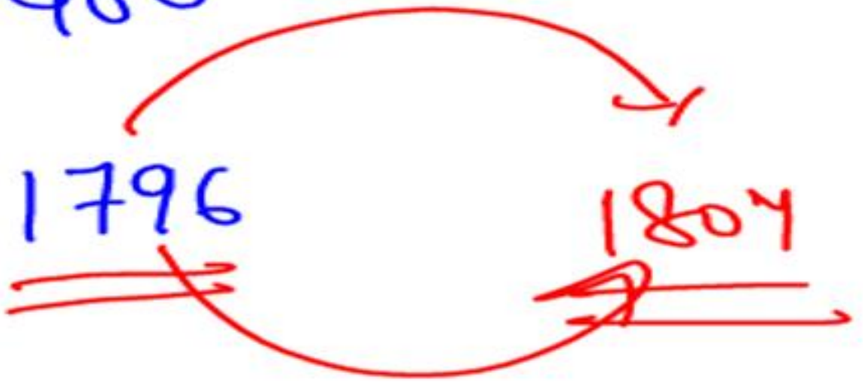
1800 is div by 4.

Cond^{n} for century year to be a leap is → It has to be div by 400



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4th April 16th June

April → 27

May → 31

June → 15

73

Q1(iv). A person is deposited Rs.12,000 in a bank on 4th April, 2019 and he withdraws the entire amount on 16th June, 2019. If the rate of interest in 16% p.a. Find the interest earned by him?

P = 12000

R = 16% / annum

$$SI = \frac{12000 \cdot 16 \cdot 73}{100 \times 365} = 384 \text{ Rs}$$

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Ans. Rs. 384

Ordinary

Jan → 31

Feb → 28

March → 31

Ap → 30

M → 31

J → 30

July → 31

Aug → 31

Sep → 30

Oct → 31

Nov → 30

Dec → 31

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Q1(v). P = 20,000

R = 18% annum

T = 2 years 4 months

S.I. = ?

2 years 4 months

$2\frac{1}{3}$

$\frac{7}{3}$ years

$$S.I = \frac{20000 \cdot 18 \cdot 7}{100 \quad 3}$$

$$= 8400 \text{ Rs}$$

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Q2. P = 50,000

R =>

6% for first 2 years

8% for next 3 years

12% for a period beyond 5 years

T = 9 Years

S.I. = ?

Sol^n

6·2 = 12%

8·3 = 24%

12·4 = 48%

84%

84% of 50000

= 42000 Rs

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Ans. Rs. 42000

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Q3. A person invested Rs.50,000 each in Mutual funds and Bank. If he invested that amount for 3 years and the interest received from Mutual funds is Rs.150 more than the bank deposit, then find the ~~different~~ between rates of both?

Detailed

Mutual — Bank

$\frac{5000 \cdot R \cdot 3}{100} - \frac{5000 \cdot x \cdot 3}{100} = 150$ difference

$\frac{5000 \cdot R' \cdot 3}{100} = 150$

$R' = \frac{1}{10}$

$R' = 0.1\%$

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Ans. $R_1 - R_2 = 0.1\%$

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Amount = Principal + Simple Interest

eg $P = 20000$

$R = 10\%$ per annum

$T = 3$ years

Amount $= 20000 + 6000$

$= 26000$

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I^st Detailed App

Q4. If P = 7500
R = ?
T = 3½ years
A = 8550

If the rate of interest is increased by 2%, then what is the new value of amount?

8550 = 7500 + SI

SI = 1050

$1050 = \frac{7500 \cdot R \cdot 7}{100 \times 2}$

R = 4

New value of R = 6

$S.I = \frac{7500 \cdot 6 \cdot 7}{100 \times 2}$

= 1575

Amount = 7500 + 1575

= 9075

II^nd Better Approach

150 Rs × 7/2 = 525 Rs extra

8550 + 525

= 9075 Rs

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Ans. Rs. 9075

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Q5(i). A certain sum amounts to Rs.6000 in 2½ years and it amounts to Rs.7200 in 4 years. Find the sum and rate of interest/annum.

$2\frac{1}{2}$ years $\rightarrow$ 6000

4 years $\rightarrow$ 7200

$1\frac{1}{2}$ SI = 1200

$\frac{3}{2}$ SI = 1200

SI = 800

P = 4000

$R = \frac{800}{4000} \times \frac{1}{5} \times 100 = 20\%$

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Ans. **Rs. 4000**

Rate of Interest = 20%

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Q5(ii). A certain sum amounts to Rs.3200 in 5 years and it amounts to Rs.3800 in 8 years. Find the sum and rate of interest/annum.

5 years → 3200

8 years → 3800

3 years SI = 600

SI = 200

P = 2200 Rs

$\frac{200}{2200} \times 100$

11

$R = 9\frac{1}{11}\%$

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Ans. Rs. 2200

Rate of Interest = $9\frac{1}{11}\%$

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Q6(i). A certain sum becomes double in 5 years at a certain rate of simple interest. Find the rate of interest/annum?

double $\longrightarrow$ 5 year

$$\frac{100\%}{5} = 20\%$$

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Ans. Rate of Interest = 20%/- annum

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Q6(ii). Triple in 20 years. Find R

$$\frac{200\%}{20} \qquad R = 10\%$$

Q6(iii). 6 times in 25 years. Find R

$$\frac{500\%}{25} \qquad R = 20\%$$

Q6(iv). 8 times in 14 years. Find R

$$\frac{700\%}{14} \qquad R = 50\%$$

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Q6(v). 4 times @ 25% annum. T = ?

$$\frac{300\%}{25\%} \qquad T = 12 \text{ years}$$

Q6(vi). 6 times @ 10% annum. T = ?

$$\frac{500\%}{10\%} = 50 \text{ years}$$

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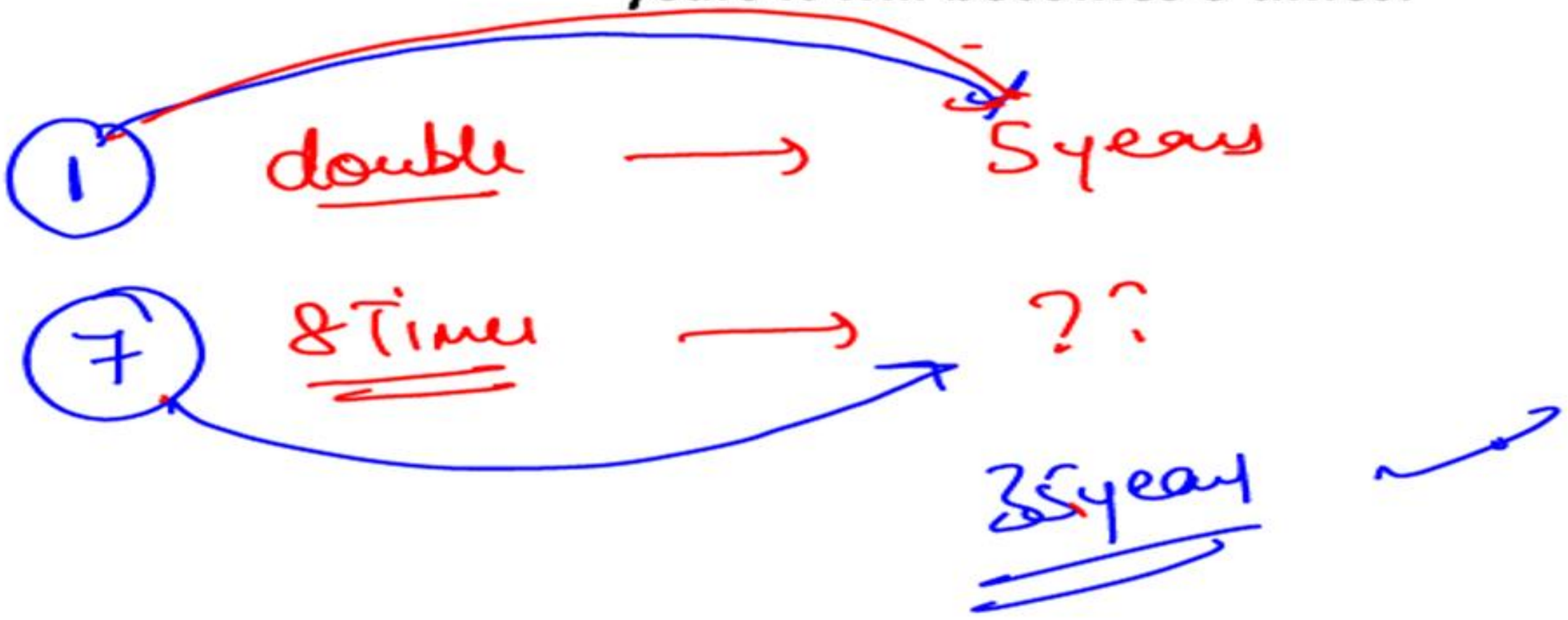
Q7(i). A certain sum becomes double in 5 years. In how many years it will becomes 8 times.



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Ans. 35 Years

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Q7(ii). Triple → 7 years
9 Times → ??

2
8

28 years

Q7(iii). 5 Times → 13 years
11 Times → ??

4
10

$13 \times \frac{10^5}{2} = 32.5$ years

6.
30.

Q7(iv). 7 Times → 8 years
31 Times → ??

$8 \times \frac{30}{6}$

40 years

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Q7(v). 5 Times → 12 years

11 Times → ??

$\frac{12^{3} \times 10}{4} = 30$ years

Q7(vi). 8 Times → 35 years

19 Times → ??

$\frac{\cancel{35}^{5} \times 18}{\cancel{2}} = 9 \cdot 4$ years

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Q8(i). If a simple interest earned on a sum is 1/9th of the sum and the numerical value of rate of interest is same as the time period. Find R.

$$SI = \frac{1}{9}P$$

$$\boxed{R = T}$$

$$S.I = \frac{P \cdot R \cdot T}{100}$$

$$\frac{P}{9} = \frac{P \cdot R \cdot R}{100}$$

$$\frac{100}{9} = R^2$$

$$R = 10/3 \Rightarrow 3\frac{1}{3}\%$$

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Ans. $R = \frac{10}{3}\%$ **/ annum**

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Q8(ii). $SI = \frac{4}{25}P$

$R = T$

Find R.

$\frac{4P}{25} = \frac{P \cdot R \cdot R}{100}$

$R^2 = 16$

$R = 4$

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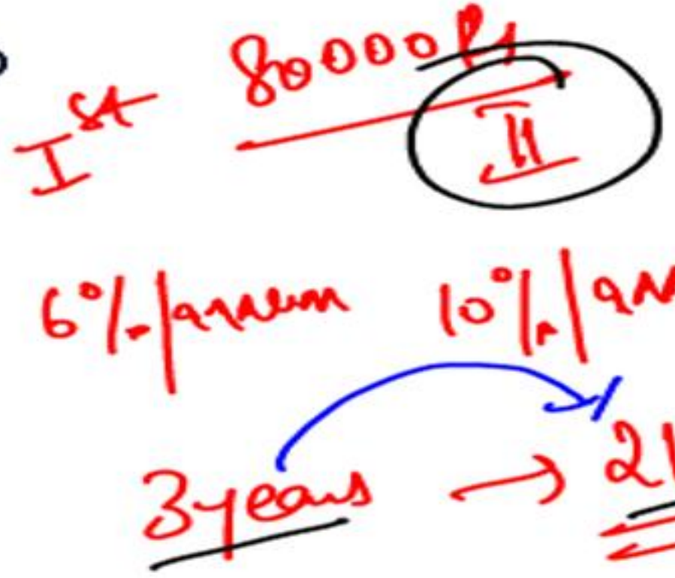

Q9. A person borrowed Rs.80000 from 2 different banks, the first bank charges at the rate of 6% p.a. and the second bank charges at the rate of 10% p.a. If the total interest paid by him to the two banks in 3 years is Rs.21600. Find the amount he borrowed from 2nd bank.

Sol^{n}

$$\frac{(80000-x)\cdot 6\cdot 1}{100} + \frac{x\cdot 10\cdot 1}{100} = 7200$$

$$= \frac{4,80,000 - 6x + 10x}{100} = 7200$$

$$4x = 2,40,000$$

$$x = 60,000$$

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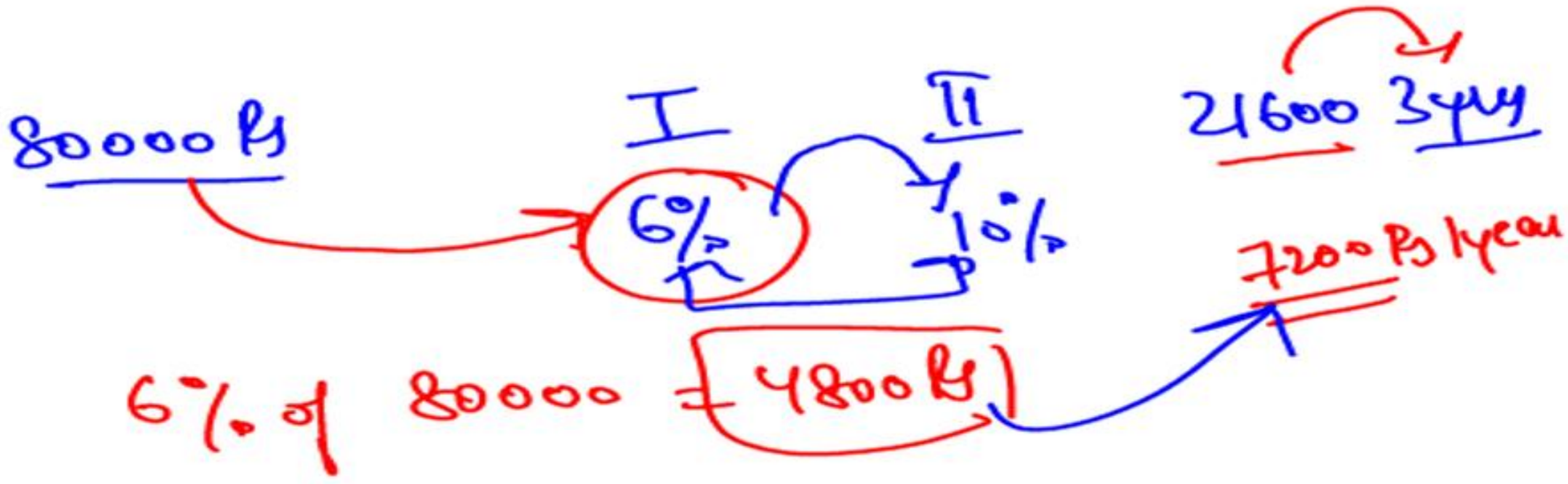
Ans. Rs. 60,000

II nd → Mixture & Alligation

III rd



4% of II = 2400

II = 60000 Rs

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PRACTICE QUESTIONS

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1. The simple interest on Rs. 2555 from July 1, 2018 to September 3, 2018 at $3\frac{1}{7}$ % rate will be —

(a) 14.08
(b) 17
(c) 15
(d) 14.30

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1. (a)

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2. What is the simple interest for 9 years on a sum of Rs. 80000 if the rate of interest for first 2 years is 6% per annum for next 3 years is 8% per annum and after period of 5 years is 12% per annum.

(a) 76800 (b) 67200

(c) 64200 (d) 50800

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2. (b)

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3. A person lends 40% of his sum of money at 15% per annum, 50% of rest at 10% per annum and the rest at 18% per annum rate of interest, if the interest is calculated on the whole sum then what would be the annual rate of interest ?

(a) 13.4%
(b) 14.33%
(c) 14.4%
(d) 13.33%

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3. (c)

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4. Rs. 400 becomes Rs. 650 at certain rate of simple interest in 5 years. If rate is increased by 2.5% per annum. What will be amount after 8 years.

(a) 880
(b) 720
(c) 800
(d) 770

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4. (a)

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5. The difference between the simple interest received from two different sources on Rs. 750 for 6 years is Rs. 22.5. The difference between their rate of interest is?

(a) 0.2%
(b) 0.5%
(c) 0.3%
(d) 0.7%

$$\frac{750 \cdot R' \cdot 6}{100} = \frac{225}{100}$$

$$R' = 1/2$$

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5. (b)

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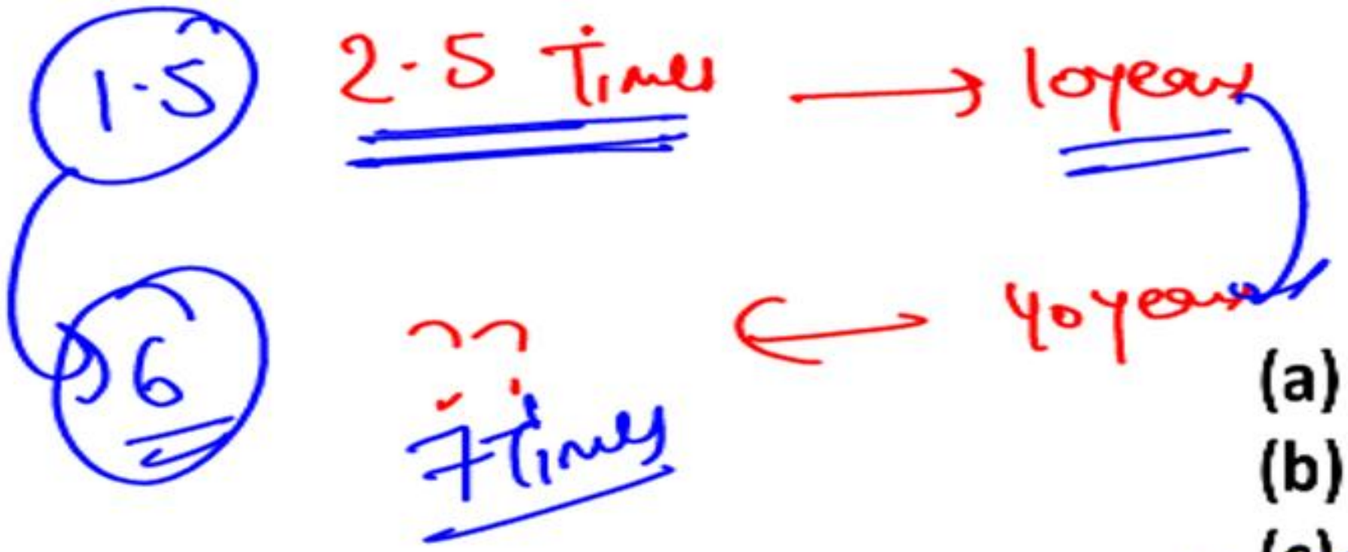

6. A sum of money invested at simple interest 2.5 times of itself in 10 years. How many times will it become in 40 years time ?

(a) 3 times
(b) 5 times
(c) 7 times
(d) 4 times

6. (c)

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7. The simple interest on a sum of money is $\frac{9}{16}$ of the principal and the number of years is equal to the rate percent per annum. The rate per annum is –

(a) $6\frac{2}{6}\%$

(b) 10%

(c) $7\frac{1}{2}\%$

(d) $7\frac{1}{3}\%$

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7. (c)

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8. A certain sum of money amounts to Rs. 950 in 3 years and to Rs. 1325 in 5½ years at a certain rate of simple interest. The rate of interest per annum is—

(a) 25%
(b) 20%
(c) 35%
(d) 30%

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8. (d)

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9. Gopal borrowed Rs. 1500 from Raman at 10% rate of interest for 2 years. he then added some money to the borrowed sum and lent it to Vinayak for the same time at 15% simple interest. If Gopal gains Rs. 240 in the whole transaction, then the sum lent by him to Vinayak is –

(a) 1600
(b) 1800
(c) 2000
(d) 2200

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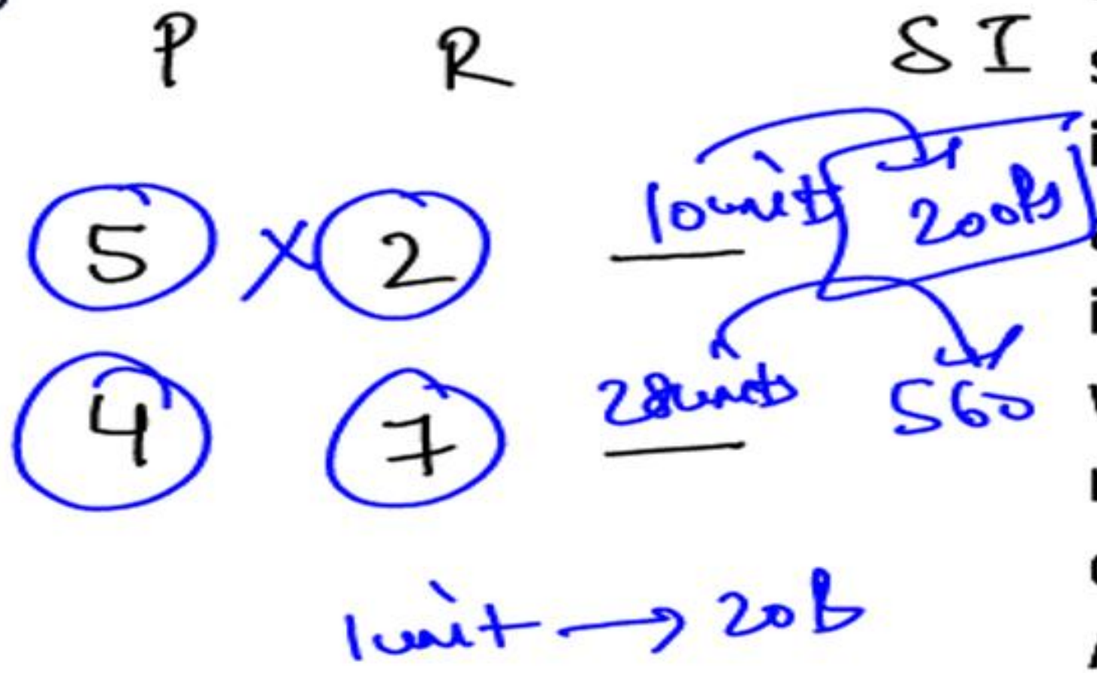
9. (b)



10. A certain interest is received on a sum of money at a certain rate of interest in a certain time. If principal amount is decreased by 20% and rate of interest becomes 3½ times then Rs. 560 will receive as a simple interest. The SI received on the original sum at the original rate of interest was ?

A. 180
B. 200
C. 220
D. 360

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10. (b)

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11. A certain sum of money amounts to Rs. 2500 in 2.5 years at 20% per annum. In how many year will it amount to Rs. 3000 at the same rate ?

(a) 3 years
(b) 4 years
(c) 5 years
(d) 6 years

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11. (b)

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12. A certain sum is invested for a certain time period. It amounts Rs. 1000 at 25% per annum. But when invested at 10% per annum, it amounts to Rs. 500. Find the time.

(a) 40 years
(b) 20 years
(c) 25 years
(d) 30 years

$$P + \frac{P \cdot 25 \cdot T}{100} = 1000 \quad -(1)$$

$$P + \frac{P \cdot 10 \cdot T}{100} = 500 \quad -(2)$$

(1) ÷ (2)

$$\frac{1 + \frac{T}{4}}{1 + \frac{T}{10}} = \frac{2}{1}$$

$$2 + \frac{T}{5} = 1 + \frac{T}{4}$$

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

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12. (b)

P	R	T	SI	A
—	25%	—	5units	1000
1unit	10%	—	2units	~~500~~ 3units

200% → 20 years
10%

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13. A man lent out certain sum of money to someone at 5% p.a. rate of interest and after 6 month he lent out the same sum of money at 6% p.a. rate of interest to another man. After a certain time he got amount of Rs. 4600 from each. What is the total sum of money he lent out to two men.

(a) 6800
(b) 7600
(c) 9000
(d) 8000

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13. (d)

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14. Dilip invested amounts in two different schemes A and B for five years in the ratio of 5 : 4 respectively. Scheme A offers 8% simple interest and bonus equal to 20% of the amount of interest earned in 5 years on maturity. Scheme B offers 9% simple interest. If the amount invested in scheme A was Rs. 20000. What was the total amount received on maturity from both the schemes ?

(a) Rs.50800

(b) Rs.51200

(c) Rs.52800

(d) Rs.58200

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14. (c)

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15. Ravi left Rs. 450,000 in his will for two sons who are 13 years and 6 years old. Simple interest offered by bank for less than 6 years is 8% p.a. and for more than 6 years is 5% p.a. Amount deposited in the bank such a way that when they attend 18 years they may receive equal amount. Find present value of the amount to be deposited for both the sons.

(a) 240000, 210000

(b) 220000, 230000

(c) 250000, 200000

(d) 2,10,000, 2,40000

15. (a)

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

(a) Rs.20,500
(b) Rs.20,200
(c) Rs.18,100
(d) Rs.21,500

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16. (a)

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17. A sum of Rs.8,400 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.9,600 at the same rate for the same time?

(a) Rs.2,990
(b) Rs.3,012
(c) Rs.2,686
(d) Rs.3,024

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17. (d)

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18. A sum amounts to Rs. 14,395.20 at 9.25% p.a. simple interest in 5.4 years. What will be the simple interest on the same sum at 8.6% p.a. in 4.5 years.

(a) Rs.3,715.20
(b) Rs.3,627
(c) Rs.3,797.76
(d) Rs.3,672

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18. (a)

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19. A sum of Rs.12,800 is invested partly at 15% p.a. and the remaining at 12% p.a. simple interest. If the total interest at the end of 3 years is Rs.5,085, then how much money was invested at 15% p.a.?

(a) Rs.5,300
(b) Rs.7,500
(c) Rs.5,200
(d) Rs.5,800

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19. (a)

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20. A sum of Rs.10,500 amounts of Rs.13,825 in $3\frac{4}{5}$ years at a certain rate % p.a. simple interest. What will be the simple interest on the same sum for 5 years at double the earlier rate?

(a) Rs.8,470
(b) Rs.8,750
(c) Rs.8,670
(d) Rs.8,560

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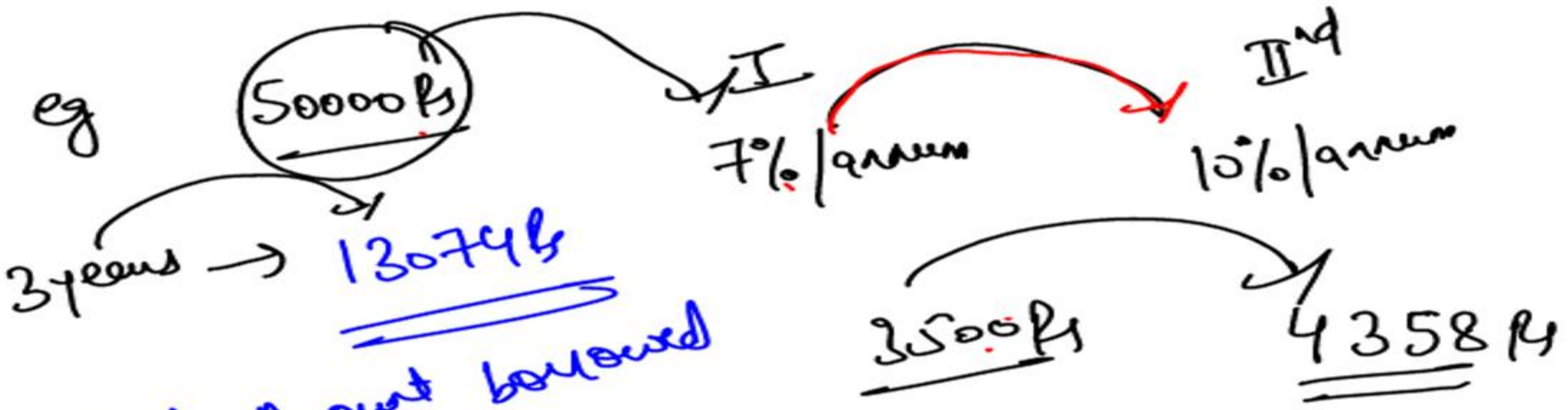
20. (b)



Find Amount borrowed from II nd Bank

3% of II = 858 Rs

1% of II = 286

II = 28600