10 SIMPLE INTEREST

Importance : Questions on simple interest are asked in different competitive exams. Note that to solve compound interest questions, a command over simple interest questions is a must.

Scope of questions : Simple interest questions don't have much variation. Here, questions to find out. Principal, interest, rate, time or amount are asked. Questions on two interest rates for different times may also be asked.

Way to success : All questions are based on a single basic formulae, but to increase speed, direct formulae are required to?

IMPORTANT POINTS

Borrowed money is called Principal and it is denoted by 'P'.

Money is borrowed for certain time period, that time is called interest time and it is denoted by 'T' or 't'.

The principal becomes Amount when interest is added to it Amount is represented as A.

So, Amount = Principal + Interest $\Rightarrow$ A = P + S. I.

OR

Interest = Amount – Principal $\Rightarrow$ S. I. = A – P

When Interest is payable half – yearly

Rate will be half and time will be twice

When Interest is payable quarterly

Rate will be one-fourth and time will be four times.

RULE 1 : Simple Interest (S.I.) $= \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

or,

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

$$P = \frac{S.I \times 100}{R \times T}, \; R = \frac{S.I \times 100}{P \times T}, \; T = \frac{S.I \times 100}{P \times R},$$

A = P + S.I

or,

S.I. = A – P

RULE 2 : If there are distinct rates of interest for distinct time periods i.e.

Rate for 1st t_1 years $\rightarrow R_1\%$

Rate for 2nd t_2 years $\rightarrow R_2\%$

Rate for 3rd t_3 years $\rightarrow R_3\%$

Then, Total S.I. for 3 years $= \frac{P(R_1t_1 + R_2t_2 + R_3t_3)}{100}$

RULE 3 : If a certain sum becomes 'n' times of itself in T years on Simple Interest, then the rate per cent per annum is.

$$R\% = \frac{(n-1)}{T} \times 100\% \text{ and,}$$

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

RULE 4 : If a certain sum becomes n_1 times of itself at $R_1\%$ rate and n_2 times of itself at $R_2\%$ rate, then,

$$R_2 = \frac{(n_2-1)}{(n_1-1)} R_1 \text{ and } T_2 = \frac{(n_2-1)}{(n_1-1)} T_1$$

RULE 5 : If Simple Interest (S.I.) becomes 'n' times of principal i.e.

S.I. = P × n then.

RT = n × 100

RULE 6 : If an Amount (A) becomes 'n' times of certain sum (P) i.e.

A = Pn then,

RT = (n – 1) × 100

RULE 7 : If the difference between two simple interests is 'x' calculated at different annual rates and times, then principal (P) is

$$P = \frac{x \times 100}{(\text{difference in rate}) \times (\text{difference in time})}$$

RULE 8 : If a sum amounts to x_1 in t years and then this sum amounts to x_2 in t yrs. Then the sum is given by

$$P = \frac{(\text{Difference in amount}) \times 100}{(\text{Change in interest Rate}) \times \text{time}}$$

RULE 9 : If a sum with simple interest rate, amounts to 'A' in t_1 years and 'B' in same t_2 years, then,

$$R\% = \frac{(B-A) \times 100}{A.t_2 - B.t_1} \text{ and}$$

$$P = \frac{At_2 - Bt_1}{t_2 - t_1}$$

RULE 10 : If a sum is to be deposited in equal instalments, then,

$$\text{Equal instalment} = \frac{A \times 200}{T[200 + (T-1)r]}$$

where T = no. of years, A = amount, r = Rate of Interest.

RULE 11 : To find the rate of interest under current deposit plan,

$$r = \frac{S.I. \times 2400}{n(n+1) \times (\text{deposited amount})}$$

where n = no. of months.

RULE 12 : If certain sum P amounts to Rs. A_1 in t_1 years at rate of R% and the same sum amounts to Rs. A_2 in t_2 years at same rate of interest R%. Then,

$$\text{(i) } R = \left(\frac{A_1 - A_2}{A_2T_1 - A_1T_2}\right) \times 100$$

$$\text{(ii) } P = \left(\frac{A_2T_1 - A_1T_2}{T_1 - T_2}\right)$$

RULE 13 : The difference between the S.I. for a certain sum P_1 deposited for time T_1 at R_1 rate of interest and another sum P_2 deposited for time T_2 at R_2 rate of interest is

$$S.I. = \frac{P_2R_2T_2 - P_1R_1T_1}{100}$$

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QUESTIONS ASKED IN PREVIOUS SSC EXAMS

TYPE–I

1. What sum of money must be given as simple interest for six months at 4% per annum in order to earn ₹ 150 interest?
(1) ₹ 5000 (2) ₹ 7500
(3) ₹10000 (4) ₹ 15000
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

2. A sum of ₹ 1600 gives a simple interest of ₹ 252 in 2 years and 3 months. The rate of interest per annum is:
(1) $5\frac{1}{2}\%$ (2) 8%
(3) 7% (4) 6%
(SSC CGL Prelim Exam. 27.02.2000 (First Sitting)

3. A sum of money lent at simple interest amounts to ₹ 880 in 2 years and to ₹ 920 in 3 years. The sum of money (in rupees) is
(1) 700 (2) 760
(3) 784 (4) 800
(SSC CISF ASI Exam. 29.08.2010 (Paper-1)

4. At some rate of simple interest, A lent ₹ 6,000 to B for 2 years and ₹ 1,500 to C for 4 years and received ₹ 9,00 as interest from both of them together. The rate of interest per annum was
(1) 5% (2) 6%
(3) 8% (4) 10%
(SSC CPO S.I. Exam. 12.12.2010 (Paper-I)

5. A lent ₹ 5000 to B for 2 years and ₹ 3000 to C for 4 years on simple interest at the same rate of interest and received ₹ 2200 in all from both as interest. The rate of interest per annum is
(1) 7% (2) 5%
(3) $7\frac{1}{8}\%$ (4) 10%
(SSC CPO S.I. Exam. 12.01.2003) & (SSC SAS Exam. 26.06.2010 (Paper-I)

6. What sum of money will amount to ₹ 520 in 5 years and to ₹ 568 in 7 years at simple interest ?
(1) ₹ 400 (2) ₹ 120
(3) ₹ 510 (4) ₹ 220
(SSC CGL Prelim Exam.11.05.2003 (First Sitting)

7. ₹ 500 was invested at 12% per annum simple interest and a certain sum of money invested at 10% per annum simple interest. If the sum of the interest on both the sum after 4 years is ₹ 480, the latter sum of money is :
(1) ₹ 450 (2) ₹ 750
(3) ₹ 600 (4) ₹ 550
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

8. A money lender finds that due to fall in the annual rate of interest 8% to $7\frac{3}{4}\%$, his yearly income diminishes by ₹ 61.50. His capital is
(1) ₹ 22400 (2) ₹ 23800
(3) ₹ 24600 (4) ₹ 26000
(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

9. A lends ₹ 2500 to B and a certain sum to C at the same time at 7% annual simple interest. If after 4 years, A altogether receives ₹ 1120 as interest from B and C, the sum lent to C is
(1) ₹ 700 (2) ₹ 6500
(3) ₹ 4000 (4) ₹ 1500
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

10. A certain sum of money amounts to ₹ 756 in 2 years and to ₹ 873 in $3\frac{1}{2}$ years at a certain rate of simple interest. The rate of interest per annum is
(1) 10% (2) 11%
(3) 12% (4) 13%
(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

11. What sum will amount to ₹ 7000 in 5 years at $3\frac{1}{3}\%$ simple interest ?
(1) ₹ 6300 (2) ₹ 6500
(3) ₹ 6000 (4) ₹ 5000
(SSC CPO S.I. Exam. 07.09.2003)

12. A man took a loan from a bank at the rate of 12% per annum at simple interest. After 3 years he had to pay ₹ 5,400 as interest only for the period. The principal amount borrowed by him was :
(1) ₹ 2,000 (2) ₹ 10,000
(3) ₹ 20,000 (4) ₹ 15,000
(SSC CGL Prelim Exam. 08.02.2004 (First Sitting)

13. A sum of money at simple interest amounts to ₹ 1,012 in $2\frac{1}{2}$ years and to ₹ 1,067.20 in 4 years. The rate of interest per annum is :
(1) 2.5% (2) 3%
(3) 4% (4) 5%
(SSC CGL Prelim Exam.08.02.2004 (Ist Sitting) & (SSC SAS Exam. 26.06.2010 (Paper-I) & (SSC CHSL DEO & LDC Exam. 28.10.2012)

14. A sum of money lent out at simple interest amounts to ₹ 720 after 2 years and to ₹1020 after a further period of 5 years. The sum is :
(1) ₹ 500 (2) ₹ 600
(3) ₹ 700 (4) ₹ 710
(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

15. The sum of money, that will give ₹ 1 as interest per day at the rate of 5% per annum simple interest is
(1) ₹ 3650 (2) ₹ 36500
(3) ₹ 730 (4) ₹ 7300
(SSC CPO S.I. Exam. 05.09.2004)

16. If the simple interest on a certain sum of money for 15 months at $7\frac{1}{2}\%$ per annum exceeds the simple interest on the same sum for 8 months at $12\frac{1}{2}\%$ per annum by ₹ 32.50, then the sum of money (in ₹) is :
(1) 312 (2) 312.50
(3) 3120 (4) 3120.50
(SSC CPO S.I. Exam. 26.05.2005)

17. What annual instalment will discharge a debt of ₹ 6450 due in 4 years at 5% simple interest ?
(1) ₹ 1500 (2) ₹ 1835
(3) ₹ 1935 (4) ₹ 1950
(SSC CGL Prelim Exam. 13.11.2005 (Ist Sitting) & (SSC CGL Tier-I Exam. 16.05.2010)

18. In what time will ₹ 72 become ₹ 81 at $6\frac{1}{4}\%$ per annum simple interest ?
(1) 2 years
(2) 3 years
(3) 2 years 6 months
(4) None of these
(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

19. The simple interest on ₹ 7,300 from 11 May, 1987 to 10 September, 1987 (both days included) at 5% per annum is
(1) ₹ 123 (2) ₹ 103
(3) ₹ 200 (4) ₹ 223
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting)

20. A person borrows ₹ 5,000 for 2 years at 4% per annum simple interest. He immediately lends it to another person at $6\frac{1}{4}\%$ per annum simple interest for 2 years. His gain in the transaction is
(1) ₹ 112.50 (2) ₹ 450
(3) ₹ 225 (4) ₹ 150
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting

21. A man had ₹ 16,000, part of which he lent at 4% and the rest at 5% per annum simple interest. If the total interest received was ₹ 700 in one year, the money lent at 4% per annum was
(1) ₹ 12,000 (2) ₹ 8,000
(3) ₹ 10,000 (4) ₹ 6,000
(SSC CGL Prelim Exam. 13.11.2005 (Second Sitting

22. ₹ 1,000 is invested at 5% per annum simple interest. If the interest is added to the principal after every 10 years, the amount will become ₹ 2,000 after
(1) 15 years (2) 18 years
(3) 20 years (4) $16\frac{2}{3}$ years
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

23. A sum of money amounts to ₹ 5,200 in 5 years and to ₹ 5,680 in 7 years at simple interest. The rate of interest per annum is
(1) 3% (2) 4%
(3) 5% (4) 6%
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

24. ₹ 800 becomes ₹ 956 in 3 years at a certain rate of simple interest. If the rate of interest is increased by 4%, what amount will ₹ 800 become in 3 years ?
(1) ₹ 1020.80 (2) ₹ 1025
(3) ₹ 1052 (4) ₹ 1050
(SSC CGL Tier-1 Exam. 26.06.2011 (Second Sitting)

25. A person deposited ₹ 400 for 2 years, ₹ 550 for 4 years and ₹ 1,200 for 6 years. He received the total simple interest of ₹ 1,020. The rate of interest per annum is
(1) 10% (2) 5%
(3) 15% (4) 20%
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

26. Manoj deposited ₹ 29400 for 6 years at a simple interest. He got ₹ 4200 as interest after 6 years. The annual rate of interest was
(1) $2\frac{8}{21}\%$ (2) $2\frac{7}{20}\%$
(3) $3\frac{8}{21}\%$ (4) $4\frac{8}{21}\%$
(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

27. A man lent ₹ 60,000, partly at 5% and the rest at 4% simple interest. If the total annual interest is ₹ 2560, the money lent at 4% was
(1) ₹ 40000 (2) ₹ 44000
(3) ₹ 30000 (4) ₹ 45000
(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

28. A sum of money at some rate of simple interest amounts to ₹ 2,900 in 8 years and to ₹ 3,000 in 10 years. The rate of interest per annum is
(1) 4% (2) $2\frac{1}{2}\%$
(3) 3% (4) 2%
(SSC CPO S.I. Exam. 09.11.2008)

29. In how many years will a sum of ₹ 3,000 yield a simple interest of ₹ 1,080 at 12% per annum ?
(1) 3 years (2) $2\frac{1}{2}$ years
(3) 2 years (4) $3\frac{1}{2}$ years
(SSC Data Entry Operator Exam. 02.08.2009)

30. A sum of money amounts to ₹ 850 in 3 years and to ₹925 in 4 years at some rate of simple interest. The sum is :
(1) ₹ 550 (2) ₹ 600
(3) ₹ 625 (4) ₹ 700
(SSC CHSL DEO & LDC Exam. 27.11.2010)

31. In what time will ₹ 1,860 amount to 2,641.20 at simple interest 12% per annum ?
(1) 3 years (2) $3\frac{1}{2}$ years
(3) 4 years (4) $4\frac{1}{2}$ years
(SSC Constable (GD) & Rifleman (GD) Exam. 22.04.2012 (IInd Sitting)

32. The population of a village decreases at the rate of 20% per annum. If its population 2 years ago was 10,000, the present population is
(1) 4600 (2) 6400
(3) 7600 (4) 6000
(SSC CHSL DEO & LDC Exam. 04.11.2012, IInd Sitting)

33. The sum lent at 5% per annum (i.e. 365 days) simple interest, that produces interest, of ₹ 2.00 a day, is
(1) ₹ 1,400 (2) ₹ 14,700
(3) ₹ 14,600 (4) ₹ 7,300
(SSC Multi-Tasking Staff Exam. 17.03.2013, Ist Sitting)

34. A certain sum of money lent out at simple interest amounts to ₹ 1380 in 3 years and ₹ 1500 in 5 years. Find the rate per cent per annum.
(1) 3% (2) 3.5%
(3) 4% (4) 5%
(SSC Multi-Tasking Staff Exam. 17.03.2013, Kolkata Region)

35. If a sum of money amounts to ₹ 12,900 and ₹ 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
(1) 10% (2) 12%
(3) 18% (4) 20%
(SSC Constable (GD) Exam. 12.05.2013 Ist Sitting)

36. In what time will ₹ 8,000, at 3% per annum, produce the same interest as ₹ 6, 000 does in 5 years at 4 % simple interest ?

(1) 5 years (2) 6 years

(3) 3 years (4) 4 years

(SSC CGL Tier-I Exam. 26.10.2014)

37. The principal which gives ₹ 1 interest per day at a rate of 5% simple interest per annum is

(1) ₹ 5000 (2) ₹ 7300

(3) ₹ 36500 (4) ₹ 3650

(SSC CGL Tier-II Exam. 12.04.2015 (TF No. 567 TL 9)

38. A sum of money lent out at simple interest amounts to Rs. 720 after 2 years and Rs. 1020 after a further period of 5 years. Find the principal.

(1) Rs. 600 (2) Rs. 1740

(3) Rs. 6000 (4) Rs. 120

(SSC CGL Tier-I Exam, 09.08.2015 (IInd Sitting) TF No. 4239378)

39. The simple interest on Rs. 36,000 for the period from 5th January to 31st May, 2013 at 9.5% per annum is

(1) Rs. 1,338 (2) Rs. 1,425

(3) Rs. 1,400 (4) Rs. 1,368

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

40. Alipta got some amount of money from her father. In how many years will the ratio of the money and the interest obtained from it be 10:3 at the rate of 6% simple interest per annum?

(1) 7 years (2) 3 years

(3) 5 years (4) 4 years

(SSC CGL Tier-I (CBE) Exam.10.09.2016)

41. The sum of money that will yield Rs. 60 as simple interest at the rate of 6% per annum in 5 years is

(1) 200 (2) 225

(3) 175 (4) 300

(SSC CGL Tier-I (CBE) Exam.11.09.2016) (Ist Sitting)

42. If a sum of money becomes 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

(1) $21\frac{3}{7}\%$ (2) $21\frac{2}{7}\%$

(3) $21\frac{1}{7}\%$ (4) $21\frac{5}{7}\%$

(SSC CGL Tier-II Online Exam.01.12.2016

43. The simple interest on a certain sum of money at the rate of 5% per annum for 8 years is Rs. 840. Rate of interest for which the same amount of interest can be received on the same sum after 5 years is :

(1) 7% per annum

(2) 8% per annum

(3) 9% per annum

(4) 10% per annum

(SSC CHSL (10+2) Tier-I (CBE) Exam. 08.09.2016) (Ist Sitting)

44. A sum of Rs. 2800 is divided into two parts in such a way that the interest on both the parts is equal. If the first part is lent at 9% p.a. for 5 years and second part is for 6 years at 10% p.a., find the two sums.

(1) Rs. 1800, Rs. 1000

(2) Rs. 1600, Rs. 1200

(3) Rs. 1400, Rs. 1400

(4) Rs. 1300, Rs. 1500

(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 05.06.2016) (Ist Sitting)

45. The simple interest on a sum for 5 years is two-fifth of the sum. The rate of interest per annum is

(1) 0.1 (2) 0.08

(3) 0.06 (4) 0.04

(SSC CGL Tier-I (CBE) Exam. 31.08.2016) (Ist Sitting)

46. If the simple interest on Rs. 400 for 10 years is Rs. 280, the rate of interest per annum is

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

(3) $7\frac{1}{4}\%$ (4) $8\frac{1}{2}\%$

(SSC CGL Tier-I (CBE) Exam. 04.09.2016) (Ist Sitting)

47. If the simple interest on Re. 1 for 1 month is 1 paisa, then the rate per cent per annum will be

(1) 10% (2) 8%

(3) 12% (4) 6%

(SSC CGL Tier-I (CBE) Exam. 07.09.2016) (Ist Sitting)

48. How much simple interest will Rs. 4000 earn in 18 months at 12% per annum?

(1) Rs. 216 (2) Rs. 360

(3) Rs. 720 (4) Rs. 960

(SSC CGL Tier-I (CBE) Exam. 01.09.2016) (IInd Sitting)

49. In how many years a sum of Rs. 3000 will yield an interest of Rs. 1080 at 12% per annum simple interest ?

(1) 4 years (2) 3 years

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

(SSC CGL Tier-I (CBE) Exam. 29.08.2016 (IST Sitting)

50. In simple interest rate per annum a certain sum amounts to Rs. 5,182 in 2 years and Rs. 5,832 in 3 years. The principal in rupees is

(1) Rs. 2882 (2) Rs. 5000

(3) Rs. 3882 (4) Rs. 4000

(SSC CGL Tier-I (CBE) Exam. 30.08.2016 (IIIrd Sitting)

51. For what sum will the simple interest at R% per annum for 2 years will be R ?

(1) Rs. $\frac{100}{2R}$ (2) Rs. 50

(3) Rs. $\frac{100}{R}$ (4) Rs. $\frac{200}{R}$

(SSC CGL Tier-I (CBE) Exam. 10.09.2016 (IInd Sitting)

52. The amount to be paid, when principal = Rs. 2000, rate of simple interest (R) = 5%, T = 2 years, is :

(1) Rs. 3,200 (2) Rs. 2,400

(3) Rs. 2,200 (4) Rs. 3,400

(SSC CGL Tier-I (CBE) Exam. 27.10.2016 (Ist Sitting)

53. The rate of simple interest for which Rs. 6,000 will amount to Rs. 6,900 in 3 years is

(1) 5% (2) 7%

(3) 2% (4) 4%

(SSC CGL Tier-I (CBE) Exam. 27.10.2016 (Ist Sitting)

TYPE–II

1. A sum of money becomes $\frac{7}{6}$ of itself in 3 years at a certain rate of simple interest. The rate per annum is :

(1) $5\frac{5}{9}\%$ (2) $6\frac{5}{9}\%$

(3) 18% (4) 25%

(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. A sum of money becomes $\frac{41}{40}$ of itself in $\frac{1}{4}$ years at a certain rate of simple interest. The rate of interest per annum is

(1) 10% (2) 1%

(3) 2.5% (4) 5%

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

3. A certain sum of money becomes three times of itself in 20 years at simple interest. In how many years does it become double of itself at the same rate of simple interest ?

(1) 8 years (2) 10 years

(3) 12 years (4) 14 years

(SSC CPO S.I. Exam. 26.05.2005)

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

(1) 4% (2) 6%

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

(SSC CGL Prelim Exam. 24.02.2002) & (SSC CGL Prelim Exam. 13.11.2005 (IInd Sitting)

5. ₹ 6,000 becomes ₹ 7,200 in 4 years at a certain rate of simple interest. If the rate becomes 1.5 times of itself, the amount of the same principal in 5 years will be

(1) ₹ 8,000 (2) ₹ 8,250

(3) ₹ 9,250 (4) ₹ 9,000

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

6. A sum of money at simple interest trebles itself in 15 years. It will become 5 times of itself in

(1) 40 years (2) 36 years

(3) 30 years (4) 25 years

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

7. If a sum of money at simple interest doubles in 12 years, the rate of interest per annum is

(1) $16\frac{2}{3}\%$ (2) 7.5%

(3) $8\frac{1}{3}\%$ (4) 10%

(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

8. At what rate of simple interest per annum will a sum become $\frac{7}{4}$ of itself in 4 years ?

(1) 18% (2) $18\frac{1}{4}\%$

(3) $18\frac{3}{4}\%$ (4) $18\frac{1}{2}\%$

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

9. A sum of money at a certain rate per annum of simple interest doubles in the 5 years and at a different rate becomes three times in 12 years. The lower rate of interest per annum is

(1) 15% (2) 20%

(3) $15\frac{3}{4}\%$ (4) $16\frac{2}{3}\%$

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

10. In how many years will a sum of money double itself at $6\frac{1}{4}\%$ simple interest per annum ?

(1) 24 years (2) 20 years

(3) 16 years (4) 12 years

(SSC CGL Tier-I Exam. 16.05.2010 (Second Sitting)

11. At a certain rate of simple interest, a certain sum of money becomes double of itself in 10 years. It will become treble of itself in

(1) 15 years (2) 18 years

(3) 20 years (4) 30 years

(SSC CISF ASI Exam. 29.08.2010 (Paper-1)

12. In how much time, will a sum of money become double of itself at 15% per annum simple interest?

(1) $6\frac{1}{4}$ years (2) $6\frac{1}{2}$ years

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

(SSC Data Entry Operator Exam. 31.08.2008)

13. In how many years will a sum of money double itself at 12% per annum?

(1) 8 yrs. 6 months

(2) 6 yrs. 9 months

(3) 8 yrs. 4 months

(4) 7 yrs. 6 months

(SSC CHSL DEO & LDC Exam. 21.10.2012 (IInd Sitting)

14. A sum amounts to double in 8 years by simple interest. Then the rate of simple interest per annum is

(1) 10% (2) 12.5%

(3) 15% (4) 20%

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014 TF No. 999 KP0)

15. A sum doubles itself in 16 years, then in how many years will it triple itself; rate of interest being simple

(1) 25 years (2) 24 years

(3) 48 years (4) 64 years

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting TF No. 545 QP 6)

16. In certain years a sum of money is doubled to itself at $6\frac{1}{4}\%$ simple interest per annum, then the required time will be

(1) 16 years (2) $12\frac{1}{2}$ years

(3) 8 years (4) $10\frac{2}{3}$ years

(SSC CGL Tier-I Exam, 09.08.2015 (Ist Sitting) TF No. 1443088)

17. 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 the rate percent per annum is

(1) 5 (2) 8

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

(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

18. A certain sum doubles in 7 years at simple interest. The same sum under the same interest rate will become 4 times in how many years.
(1) 14 (2) 28
(3) 21 (4) 10
(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

19. A certain sum of money amounts to Rs. 2200 at 5% p.a. rate of interest, Rs. 2320 at 8% interest in the same period of time. The period of time is :
(1) 3 years (2) 4 years
(3) 5 years (4) 2 years
(SSC CAPFs (CPO) SI & ASI, Delhi Police Exam. 20.03.2016) (IInd Sitting)

20. At what per cent of simple interest will a sum of money double itself in 15 years?
(1) $6\frac{1}{3}\%$ (2) $6\frac{2}{3}\%$
(3) $6\frac{1}{2}\%$ (4) 6%
(SSC CGL Tier-I (CBE) Exam. 03.09.2016) (IInd Sitting)

21. If a sum of money deposited in a bank at simple interest is doubled in 6 years, then after 12 years, the amount will be
(1) $\frac{5}{2}$ times the original amount
(2) 3 times the original amount
(3) $\frac{7}{2}$ times the original amount
(4) 4 times the original amount
(SSC CGL Tier-I (CBE) Exam. 03.09.2016 (IInd Sitting)

22. The rate of simple interest for which a sum of money becomes 5 times of itself in 8 years is :
(1) 30% (2) 40%
(3) 50% (4) 55%
(SSC CGL Tier-I (CBE) Exam. 04.09.2016 (IIIrd Sitting)

23. If a sum of money doubles itself in 8 years, then the interest rate in percentage is
(1) $8\frac{1}{2}\%$ (2) 10%
(3) $10\frac{1}{2}\%$ (4) $12\frac{1}{2}\%$
(SSC CGL Tier-I (CBE) Exam. 10.09.2016 (IIIrd Sitting)

24. The rate of simple intereset per annum at which a sum of money doubles itself in $16\frac{2}{3}$ years is
(1) 4% (2) 5%
(3) 6% (4) $6\frac{2}{3}\%$
(SSC CGL Tier-I (CBE) Exam. 11.09.2016 (IInd Sitting)

TYPE–III

1. In what time will the simple interest be $\frac{2}{5}$ of the principal at 8 per cent per annum?
(1) 8 years (2) 7 years
(3) 5 years (4) 6 years
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

2. The simple interest on a sum after 4 years is $\frac{1}{5}$ of the sum. The rate of interest per annum is
(1) 4% (2) 5%
(3) 6% (4) 8%
(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

3. Simple interest on a certain sum for 6 years is $\frac{9}{25}$ of the sum. The rate of interest is
(1) 6% (2) $6\frac{1}{2}\%$
(3) 8% (4) $8\frac{1}{2}\%$
(SSC CGL Tier-1 Exam. 19.06.2011 (Second Sitting)

4. The simple interest on a sum for 5 years is one fourth of the sum. The rate of interest per annum is
(1) 5% (2) 6%
(3) 4% (4) 8%
(SSC CGL Tier-1 Exam. 26.06.2011 (First Sitting)

5. On a certain sum, the simple interest at the end of $6\frac{1}{4}$ years becomes $\frac{3}{8}$ of the sum. The rate of interest is
(1) 5% (2) 6%
(3) 7% (4) 8%
(SSC CPO (SI, ASI & Intelligence Officer) Exam. 28.08.2011 (Paper-I)

6. The present worth of a bill due 7 months hence is ₹ 1200 and if the bill were due at the end of $2\frac{1}{2}$ years its present worth would be ₹ 1016. The rate per cent is
(1) 5% (2) 10%
(3) 15% (4) 20%
(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014, IInd Sitting TF No. 545 QP 6)

7. At the rate of simple interest per annum, the interest on a certain sum of money for 10 years will be $\frac{2}{5}$ th part of the amount, then the rate of simple interest is
(1) 5% (2) $6\frac{2}{3}\%$
(3) 7% (4) $4\frac{1}{2}\%$
(SSC CGL Tier-II Exam, 2014 12.04.2015 (Kolkata Region) TF No. 789 TH 7)

8. A and B borrowed Rs. 3000 and Rs. 3200 respectively at the same rate of interest for $2\frac{1}{2}$ years. If B paid Rs. 40 more interest than A, find the rate of interest.
(1) 5% (2) 7%
(3) 8% (4) 6%
(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam, 21.06.2015 IInd Sitting)

TYPE–IV

1. The simple interest on a certain sum at 5% per annum for 3 years and 4 years differ by ₹ 42. The sum is :
(1) ₹ 210 (2) ₹ 280
(3) ₹ 750 (4) ₹ 840
(SSC CGL Prelim Exam. 04.07.1999 (First Sitting)

2. The difference between the simple interest received from two different sources on ₹ 1500 for 3 years is ₹ 13.50. The difference between their rates of interest is:
(1) 0.1% (2) 0.2%
(3) 0.3% (4) 0.4%
(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

3. 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 percent per annum. The rate per annum is :

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

(3) 6% (4) $7\frac{1}{5}\%$

(SSC CGL Prelim Exam. 27.02.2000 (Second Sitting)

4. The simple interest on a certain sum for 8 months at 4% per annum is ₹ 129 less than the simple interest on the same sum for 15 months at 5% per annum. The sum is :

(1) ₹ 2,580 (2) ₹ 2400

(3) ₹ 2529 (4) ₹ 3600

(SSC CGL Prelim Exam. 11.05.2003 (First Sitting)

5. Mohan lent some amount of money at 9% simple interest and an equal amount of money at 10% simple interest each for two years. If his total interest was Rs. 760, what amount was lent in each case ?

(1) ₹ 1700 (2) ₹ 1800

(3) ₹ 1900 (4) ₹ 2000

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

6. Simple interest on a certain sum at a certain annual rate of interest is $\frac{16}{25}$ of the sum. If the number representing rate per cent and time in years be equal, then the rate of interest is

(1) 8% (2) $11\frac{1}{2}\%$

(3) $12\frac{1}{2}\%$ (4) $12\frac{1}{4}\%$

(SSC CGL Prelim Exam. 08.02.2004 (IInd Sitting) & (SSC CGL Tier-I Exam. 26.06.2011) (IInd Sitting)

7. A sum of ₹ 1500 is lent out in two parts in such a way that the simple interest on one part at 10% per annum for 5 years is equal to that on another part at 12.5% per annum for 4 years. The sum lent out at 12.5% is :

(1) ₹ 500 (2) ₹ 1000

(3) ₹ 750 (4) ₹ 1250

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

8. If the simple interest for 6 years be equal to 30% of the principal, it will be equal to the principal after

(1) 20 years (2) 30 years

(3) 10 years (4) 22 years

(SSC CPO S.I. Exam. 03.09.2006)

9. Simple interest on ₹ 500 for 4 years at 6.25% per annum is equal to the simple interest on ₹ 400 at 5% per annum for a certain period of time. The period of time is

(1) 4 years (2) 5 years

(3) $6\frac{1}{4}$ years (4) $8\frac{2}{3}$ years

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

10. The simple interest on a sum of money is $\frac{1}{16}$ of the principal and the number of years is equal to the rate per cent per annum. The rate per annum is

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

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

(SSC Section Officer (Commercial Audit) Exam. 30.09.2007 (IInd Sitting) & (SSC CHSL DEO & LDC Exam. 27.10.2013)

11. If ₹ 12,000 is divided into two parts such that the simple interest on the first part for 3 years at 12% per annum is equal to the simple interest on the second part for $4\frac{1}{2}$ years at 16% per annum, the greater part is

(1) ₹ 8,000 (2) ₹ 6,000

(3) ₹ 7,000 (4) ₹ 7,500

(SSC CGL Prelim Exam. 27.07.2008 (Second Sitting)

12. The simple interest on a sum of money is $\frac{1}{4}$th of the principal and the number of years is equal to rate per cent per annum. The rate per cent is

(1) 2.5% (2) 5%

(3) 7.5% (4) 10%

(SSC CPO S.I. Exam. 06.09.2009)

13. Equal sum of money are lent to X and Y at 7.5% per annum for a period of 4 years and 5 years respectively. If the difference in interest, paid by them was ₹ 150, the sum lent to each was

(1) ₹ 500 (2) ₹ 1000

(3) ₹ 2000 (4) ₹ 3000

(SSC CPO S.I. Exam. 06.09.2009)

14. A sum of ₹ 1750 is divided into two parts such that the interests on the first part at 8% simple interest per annum and that on the other part at 6% simple interest per annum are equal. The interest on each part (In rupees) is

(1) 60 (2) 65

(3) 70 (4) 40

(SSC CGL Prelim Exam. 24.02.2002 (Middle Zone)

15. A borrows ₹ 800 at the rate of 12% per annum simple interest and B borrows ₹ 910 at the rate of 10% per annum, simple interest. In how many years will their amounts of debt be equal ?

(1) 18 years (2) 20 years

(3) 22 years (4) 24 years

(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

16. The simple interest on a sum of money is $\frac{1}{9}$ of the principal and the number of years is equal to rate per cent per annum. The rate per annum is

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

(3) $3\frac{1}{3}\%$ (4) $\frac{3}{10}\%$

(SSC CPO SI. Exam. 12.12.2010) & (SSC CGL Tier-1 Exam. 19.06.2011) (First Sitting)

17. A person deposited ₹ 500 for 4 years and ₹ 600 for 3 years at the same rate of simple interest in a bank. Altogether he received ₹ 190 as interest. The rate of simple interest per annum was

(1) 4% (2) 5%

(3) 2% (4) 3%

(SSC Multi-Tasking Staff Exam. 17.03.2013, IInd Sitting)

18. The difference between the simple interest received from two different banks on ₹ 500 for 2 years is ₹ 2.50. The difference between their (per annum) rate of interest is :
(1) 0.10% (2) 0.25%
(3) 0.50% (4) 1.00%
(SSC CHSL DEO CHSL DEO & LDC Exam. 27.11.2010) & (SSC CHSL DEO & LDC Exam. 04.11.2012)

19. In how many years will the simple interest on a sum of money be equal to the principal at the rate of $16\frac{2}{3}\%$ per annum ?
(1) 4 years (2) 5 years
(3) 6 years (4) 8 years
(SSC CHSL DEO & LDC Exam. 28.11.2010 (IInd Sitting)

20. The rate of interest per annum at which the total simple interest of a certain capital for 1 year is equal to the total simple interest of the same capital at the rate of 5% per annum for 2 years, is
(1) $\frac{5}{2}\%$ (2) 10%
(3) 25% (4) 12.5%
(SSC Delhi Police S.I. (SI) Exam. 19.08.2012)

21. The simple interest on ₹ 4,000 in 3 years at the rate of x% per annum equals the simple interest on ₹ 5,000 at the rate of 12% per annum in 2 years. The value of x is
(1) 10% (2) 6%
(3) 8% (4) 9%
(SSC Graduate Level Tier-I Exam. 19.05.2013 Ist Sitting)

22. If x, y, z are three sum of money such that y is the simple interest on x and z is the simple interset on y for the same time and at the same rate of interest, then we have
(1) $z^2 = xy$ (2) $xyz = 1$
(3) $x^2 = yz$ (4) $y^2 = zx$
(SSC CHSL DEO & LDC Exam. 10.11.2013, IInd Sitting)

23. Prakash lends a part of ₹ 20,000 at 8% simple interest and remaining at $\frac{4}{3}\%$ simple interest. His total income after a year was ₹ 800. Find the sum lent at 8%.
(1) ₹ 8,000 (2) ₹ 12,000
(3) ₹ 6,000 (4) ₹ 10,000
(SSC CGL Tier-II Exam. 21.09.2014)

24. Ram deposited a certain sum of money in a company at 12% per annum simple interest for 4 years and deposited equal amount in fixed deposit in a bank for 5 years at 15% per annum simple interest. If the difference in the interest from two sources is ₹ 1350, then the sum deposited in each case is :
(1) ₹ 3000 (2) ₹ 4000
(3) ₹ 5000 (4) ₹ 6500
(SSC CGL Tier-I Exam, 16.08.2015 (IInd Sitting) TF No. 2176783)

25. The difference between simple interest and the true discount on Rs. 2400 due 4 years hence at 5% per annum simple interest is
(1) Rs. 30 (2) Rs. 70
(3) Rs. 80 (4) Rs. 50
(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)

TYPE–V

1. A sum of ₹1550 was lent partly at 5% and partly at 8% simple interest. The total interest received after 3 years is ₹ 300. The ratio of money lent at 5% to that at 8% is :
(1) 5 : 8 (2) 8 : 5
(3) 31 : 6 (4) 16 : 15
(SSC CGL Prelim Exam. 24.02.2002 (First Sitting)

2. A person lent ₹ 5,000 partly at the rate of 4 per cent and partly at the rate of 5 per cent per annum simple interest. The total interest after 2 years is ₹ 440. To find the sum of money lent at each of the above rates, ₹ 5,000 is to be divided in the ratio :
(1) 4 : 5 (2) 3 : 2
(3) 5 : 4 (4) 2 : 3
(SSC CGL Prelim Exam. 24.02.2002 (Second Sitting)

3. A person borrows some money for 5 years and loan amount : total interest amount is 5 : 2. The ratio of loan amount : interest rate is equal to :
(1) 2 : 25 (2) 2 : 1
(3) 5 : 2 (4) 25 : 2
(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

4. A person invests money in three different schemes for 6 years, 10 years and 12 years at 10 per cent, 12 per cent and 15 per cent simple interest respectively. At the completion of each scheme, he gets the same interest. The ratio of his investment is
(1) 6 : 3 : 2 (2) 2 : 3 : 4
(3) 3 : 4 : 6 (4) 3 : 4 : 2
(SSC Section Officer (Commercial Audit) Exam. 26.11.2006 (Second Sitting)

5. With a given rate of simple inerest, the ratio of principal and amount for a certain period of time is 4 : 5. After 3 years, with the same rate of interest, the ratio of the principal and amount becomes 5 : 7. The rate of interest is
(1) 4% (2) 6%
(3) 5% (4) 7%
(SSC CGL Prelim Exam. 04.02.2007 (First Sitting)

6. Ratio of the principal and the amount after 1 year is 10:12. Then the rate of interest per annum is :
(1) 12% (2) 16%
(3) 18% (4) 20%
FCI Assistant Grade-III Exam. 05.02.2012 (Paper-I) East Zone (IInd Sitting)

7. In a certain time, the ratio of a certain principal and the simple interest obtained from it are in the ratio 10 : 3 at 10% interest per annum. The number of years the money was invested is
(1) 1 year (2) 3 years
(3) 5 years (4) 7 years
(SSC Multi-Tasking (Non-Technical) Staff Exam. 20.02.2011)

8. ₹12,000 is divided into two parts so that the simple interest on the first part for 3 years at 12% per annum may be equal to the simple interest on the second part for $4\frac{1}{2}$ years at 16% per annum. The ratio of the first part to the second part is
(1) 2 : 1 (2) 1 : 2
(3) 2 : 3 (4) 3 : 2
(SSC CHSL DEO & LDC Exam. 28.10.2012, Ist Sitting)

9. If ratio of principal and simple interest for 1 year is 25 : 1, then the rate of interest is
(1) 4% (2) 25%
(3) 5% (4) 20%
(SSC CGL Tier-I Re-Exam, 30.08.2015)

10. If the ratio of principal and the simple interest for 5 years is 10 : 3, then the rate of interest is :

(1) 5% (2) 6%

(3) 8% (4) 3%

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)

11. A sum of Rs. 4000 is lent out in two parts, one at 8% simple interest and the other at 10% simple interest. If the annual interest is Rs. 352, the sum lent at 8% is

(1) Rs. 2900 (2) Rs. 2200

(3) Rs. 2400 (4) Rs. 3100

(SSC CGL Tier-II (CBE) Exam. 30.11.2016)

TYPE–VI

1. A sum of ₹ 400 amounts to ₹ 480 in 4 years. What will it amount to if the rate of interest is increased by 2%?

(1) ₹ 484 (2) ₹ 560

(3) ₹ 512 (4) None of these

(SSC CGL Prelim Exam. 27.02.200 (First Sitting)

2. A man loses ₹ 55.50 yearly when the annual rate of interest falls from 11.5% to 10%. His capital (in rupees) is

(1) 3700 (2) 7400

(3) 8325 (4) 11100

(SSC CGL Prelim Exam. 11.05.2003 (Second Sitting)

3. If the annual rate of simple interest increases from 10% to $12\frac{1}{2}\%$, a man's yearly income increases by ₹ 1250. His principal (in rupees) is

(1) 50,000 (2) 45,000

(3) 60,000 (4) 65,000

(SSC CGL Prelim Exam. 08.02.2004 (Second Sitting)

4. A sum was invested on simple interest at a certain rate for 2 years. Had it been put at 3% higher rate, it would have fetched ₹ 72 more. The sum is

(1) ₹ 1,200 (2) ₹ 1,500

(3) ₹ 1,600 (4) ₹ 1,800

(SSC CPO S.I. Exam. 06.09.2009)

5. A sum of money was lent at simple interest at a certain rate for 3 years. Had it been lent at 2.5% per annum higher rate, it would have fetched ₹ 540 more. The money lent was :

(1) ₹ 6400 (2) ₹ 6472

(3) ₹ 6840 (4) ₹ 7200

(SSC CHSL DEO & LDC Exam. 27.11.2010)

6. A sum of money was invested at a certain rate of simple interest for 2 years . Had it been invested at 1% higher rate, it would have fetched ₹ 24 more interest. The sum of money is :

(1) ₹ 1200 (2) ₹ 1050

(3) ₹ 1000 (4) ₹ 9600

(SSC CHSL DEO & LDC Exam. 28.11.2010 (Ist Sitting)

7. A person who pays income tax at the rate of 4 paise per rupee, find that a fall of interest rate from 4% to 3.75% diminishes his net yearly income by ₹ 48. What is his capital ?

(1) ₹ 24,000 (2) ₹ 25,000

(3) ₹ 20,000 (4) ₹ 18,000

(SSC CHSL DEO & LDC Exam. 04.11.2012, IInd Sitting)

8. A sum was lent at simple interest at a certain rate for 2 years. Had it been lent at 3% higher rate, it would have fetched ₹ 300 more. The original sum of money was :

(1) ₹ 5000 (2) ₹ 6000

(3) ₹ 7000 (4) ₹ 4000

(SSC Multi-Tasking Staff Exam. 10.03.2013)

9. A sum of ₹2,400 amounts to ₹3,264 in 4 years at a certain rate of simple interest. If the rate of interest is increased by 1%, the same sum in the same time would amount to

(1) ₹ 3,288 (2) ₹ 3,312

(3) ₹ 3,340 (4) ₹ 3,360

(SSC Multi-Tasking Staff Exam. 24.03.2013, Ist Sitting)

10. ₹ 800 amounts to ₹ 920 in 3 years at simple interest. If the interest rate is increased by 3%, it would amount to

(1) ₹ 1,056 (2) ₹ 1,112

(3) ₹ 1,182 (4) ₹ 992

(SSC CAPFs SI, CISF ASI & Delhi Police SI Exam. 22.06.2014)

11. 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 in the same period ?

(1) ₹ 992 (2) ₹ 962

(3) ₹ 942 (4) ₹ 982

(SSC CHSL DEO & LDC Exam. 02.11.2014 (IInd Sitting)

12. The amount ₹ 2,100 became ₹ 2,352 in 2 years at simple interest. If the interest rate is decreased by 1%, what is the new interest ?

(1) ₹ 210 (2) ₹ 220

(3) ₹ 242 (4) ₹ 252

(SSC CHSL DEO Exam. 02.11.2014 (Ist Sitting)

13. A sum of Rs. 800 becomes Rs. 956 in 3 years at a certain rate of simple interest. If the rate of interest is increased by 4%, what amount will the same sum become in 3 years ?

(1) Rs. 1025 (2) RS. 1042

(3) Rs. 1052 (4) Rs. 1024

(SSC Constable (GD) Exam, 04.10.2015, Ist Sitting)

14. The rate of simple interest per annum of bank being decreased from 5% to $3\frac{1}{2}\%$, the annual income of a person from interest was less by Rs. 105. The sum deposited at the bank was

(1) Rs. 6,000 (2) Rs. 7,200

(3) Rs. 6,800 (4) Rs. 7,000

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 20.12.2015 (Ist Sitting) TF No. 9692918)

TYPE–VII

1. A sum of ₹ 10,000 is lent partly at 8% and remaining at 10% per annum. If the yearly interest on the average is 9.2%, the two parts are :

(1) ₹ 4000, ₹ 6000

(2) ₹ 4500, ₹ 5500

(3) ₹ 5000, ₹ 5000

(4) ₹ 5500, ₹ 4500

(SSC CGL Prelim Exam. 04.07.1999 (Second Sitting)

2. A sum of ₹ 1000 is lent out partly at 8% and the remaining at 10% per annum. If the yearly income on the average is 9.2%, the two parts respectively are

(1) ₹ 400, ₹ 600 (2) ₹ 450, ₹ 550

(3) ₹ 500, ₹ 500 (4) ₹ 550, ₹ 450

(SSC Section Officer (Commercial Audit) Exam. 16.11.2003)

3. An old article is available for ₹ 12,000 at cash payment or is available for ₹ 7,000 cash payment and a monthly instalment of ₹ 630 for 8 months. The rate per cent per annum is

(1) 2.1 per cent (2) 3 per cent

(3) 3.25 per cent (4) 3.3 per cent

(SSC Section Officer (Commercial Audit) Exam. 25.09.2005)

4. The effective annual rate of interest, corresponding to a nominal rate of 6% per annum payable half yearly, is :

(1) 6.06% (2) 6.07%

(3) 6.08% (4) 6.09%

(SSC CGL Prelim Exam. 13.11.2005 (First Sitting)

5. 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. What would be the annual rate of interest, if the interest is calculated on the whole sum ?

(1) 13.4% (2) 14.33%

(3) 14.4% (4) 13.33%

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

6. Ramesh deposited ₹ 15600 in a fixed deposit at the rate of 10% per annum simple interest. After every second year, he adds his interest earnings to the principal. The interest at the end of fourth year is

(1) ₹ 1716 (2) ₹ 1560

(3) ₹ 3432 (4) ₹ 1872

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

7. A part of ₹ 1500 was lent at 10% per annum and the rest at 7% per annum simple interest. The total interest earned in three years was ₹ 396. The sum lent at 10% was

(1) ₹ 900 (2) ₹ 800

(3) ₹ 700 (4) ₹ 600

(SSC CGL Prelim Exam. 04.02.2007 (Second Sitting)

8. What equal instalment of annual payment will discharge a debt which is due as ₹ 848 at the end of 4 years at 4% per annum simple interest ?

(1) ₹ 212 (2) ₹ 200

(3) ₹ 250 (4) ₹ 225

(SSC CPO S.I. Exam. 16.12.2007)

9. Out of ₹ 50,000, that a man has, he lends ₹ 8000 at $5\frac{1}{2}\%$ per annum simple interest and Rs. 24,000 at 6 % per annum simple interest. He lends the remaining money at a certain rate of interest so that he gets total annual interest of ₹ 3680. The rate of interest per annum, at which the remaining money is lent, is

(1) 5% (2) 7%

(3) 10% (4) 12%

(SSC CGL Prelim Exam. 27.07.2008 (First Sitting)

10. A man invests half his capital at the rate of 10% per annum, one-third at 9% and the rest at 12% per annum. The average rate of interest per annum, which he gets, is

(1) 9% (2) 10%

(3) 10.5% (4) 12%

(SSC CISF ASI Exam. 29.08.2010 (Paper-1)

11. John invested a sum of money at an annual simple interest rate of 10%. At the end of four years the amount invested plus interest earned was ₹ 770. The amount invested was

(1) ₹ 650 (2) ₹ 350

(3) ₹ 550 (4) ₹ 500

(SSC CISF Constable (GD) Exam. 05.06.2011)

12. Arun lends ₹ 20,000 to two of his friends. He gives ₹ 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

(1) 8% (2) 16%

(3) 12% (4) 13%

(SSC Graduate Level Tier-II Exam.16.09.2012)

13. A person invests ₹12,000 as fixed deposit at a bank at the rate of 10% per annum simple interest. But due to some pressing needs he has to withdraw the entire money after 3 years, for which the bank allowed him a lower rate of interest. If he gets ₹3,320 less than what he would have got at the end of 5 years, the rate of interest allowed by the bank is

(1) $7\frac{5}{9}\%$ (2) $7\frac{4}{9}\%$

(3) $7\frac{8}{9}\%$ (4) $8\frac{7}{9}\%$

(SSC CHSL DEO & LDC Exam. 21.10.2012 (Ist Sitting)

14. A certain scheme of investment in simple interest declares that it trebles the investment in 8 years. If you want to quadruple your money through that scheme, you have to invest it for :

(1) 11 years 6 months

(2) 10 years 8 months

(3) 10 years (4) 12 years

(SSC CHSL DEO & LDC Exam. 21.10.2012 (IInd Sitting)

15. If a man receives on one-fourth of his capital 3% interest, on two third 5% and on the remainder 11%, the percentage he receives on the whole is

(1) 4.5% (2) 5%

(3) 5.5% (4) 5.2%

(SSC CHSL DEO & LDC Exam. 04.11.2012 (IInd Sitting)

16. At the same rate of simple interest sum of the interest of ₹ 300 for 4 years and the interest of ₹ 400 for 3 years is ₹ 120. The rate of interest is

(1) 5 % (2) 4%

(3) 6% (4) 10%

(SSC Multi-Tasking Staff Exam. 10.03.2013, Ist Sitting : Patna)

17. Nitin borrowed some money at the rate of 6% p.a. for the first three 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 ₹ 8,160, the money borrowed by him (in ₹) was

(1) 12,000 (2) 6,000

(3) 8,000 (4) 10,000

(SSC FCI Assistant Grade-III Main Exam. 07.04.2013)

18. Two equal sums were lent out at 7% and 5% S.I. respectively. The interest earned on the two loans add up to ₹ 960 for 4 years. The total sum lent out in

(1) ₹ 3500 (2) ₹ 2500

(3) ₹ 2000 (4) ₹ 3000

(SSC Constable (GD) Exam. 12.05.2013)

19. Mohan lends Rs. 500 to John and a certain sum to Tom at the same time at a simple interest of 8% per annum. If in 4 years, he altogether receives Rs. 210 as interest from the two, then the sum of money he lent to Tom was

(1) Rs. 144.75 (2) Rs. 148

(3) Rs. 156.25 (4) Rs. 165.50

(SSC CHSL (10+2) DEO & LDC Exam. 16.11.2014 , Ist Sitting TF No. 333 LO 2)

20. What should be the least number of years in which the simple interest on Rs. 2600 at $6\frac{2}{3}\%$ will be an exact number of rupees ?

(1) 3 (2) 2

(3) 5 (4) 4

(SSC Constable (GD) Exam, 04.10.2015, IInd Sitting)

21. Ram bought a bike for Rs. 60,000. He paid Rs. 10000 cash down and the rest at the end of 2 years at 15% simple interest. How much more did he pay as simple interest ?

(1) Rs. 15,000 (2) Rs. 25,000

(3) Rs. 35,000 (4) Rs. 50,000

(SSC Constable (GD) Exam, 04.10.2015, IInd Sitting)

22. A sum of Rs. 7,930 is divided into three parts and given on 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 A received a loan of

(1) Rs. 3,050 (2) Rs. 2,760

(3) Rs. 2,750 (4) Rs. 2,800

(SSC CGL Tier-II Exam, 25.10.2015, TF No. 1099685)

23. A man buys a TV priced at Rs. 16000. He pays Rs. 4000 at once and the rest after 15 months on which he is charged a simple interest at the rate of 12% per year. The total amount he pays for the TV is

(1) Rs. 18,200 (2) Rs. 17,800

(3) Rs. 16,800 (4) Rs. 17,200

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 01.11.2015, IInd Sitting)

24. If Rahim deposited the same amount of Rs. x in a bank at the beginning of successive 3 years and the bank pays simple interest of 5% per annum, then the amount at his credit at the end of 3rd year will be :

(1) Rs. $\frac{861x}{400}$ (2) Rs. $\frac{1261x}{400}$

(3) Rs. $\frac{21x}{20}$ (4) Rs. $\frac{26481x}{8000}$

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 15.11.2015 (IInd Sitting) TF No. 7203752)

25. A boy aged 12 years is left with Rs. 100,000 which is under a trust. The trustees invest the money at 6% per annum and pay the minor boy a sum of Rs. 2500, for his pocket money at the end of each year. The expenses of trust come out to be Rs. 500 per annum. Find the amount that will be handed over to the minor boy after he attains the age of 18 years.

(1) Rs. 120000 (2) Rs. 150000

(3) Rs. 118000 (4) Rs. 125000

(SSC CHSL (10+2) LDC, DEO & PA/SA Exam, 06.12.2015 (Ist Sitting) TF No. 1375232)

26. If A borrowed Rs. P at x% and B borrowed Rs. Q (> P) at y% per annum at simple interest at the same time, then the amount of their debts will be equal after

(1) $100\left(\frac{Q-P}{Px-Qy}\right)$ years

(2) $100\left(\frac{Px-Qy}{Q-P}\right)$ years

(3) $100\left(\frac{Px-Qy}{P-Q}\right)$ years

(4) $100\left(\frac{P-Q}{Px-Qy}\right)$ years

(SSC CGL Tier-II Online Exam.01.12.2016))

27. A money lender claims to lend money at the rate of 10% per annum simple interest. However, he takes the interest in advance when he lends a sum for one year. At what interest rate does he lend the money actually?

(1) 10% (2) $10\frac{1}{9}\%$

(3) 11% (4) $11\frac{1}{9}\%$

(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

28. Ramesh borrowed a sum at 5 per annum simple interest from Rahul. He returns the amount after 5years. Rahul returns 2 % of the total amount received. How much did Ramesh borrowed if he received Rs. 5?

(1) Rs. 250 (2) Rs. 200

(3) Rs. 150 (4) Rs. 175

(SSC CPO SI, ASI Online Exam.05.06.2016) (IInd Sitting)

29. A man buys a watch for Rs. 1950 in cash and sells it for Rs. 2200 at a credit of 1 year. If the rate of interest be 10% per annum, then how much profit or loss will he have?

(1) Rs. 55 gain (2) Rs. 30 profit

(3) Rs. 30 loss (4) Rs. 30 profit

(SSC CGL Tier-I (CBE) Exam. 27.08.2016) (IInd Sitting)

30. A money lender lends Rs. 400 for 3 years to a person and lends Rs. 500 for 4 years to the other person at the same rate of simple interest. If altogether he receives Rs. 160 as interest, what is the rate of interest per annum ?

(1) 5% (2) 7%

(3) 9% (4) 10%

(SSC CGL Tier-I (CBE) Exam. 08.09.2016 (IIIrd Sitting)

SHORT ANSWERS

TYPE-I

1. (2)	**2.** (3)	**3.** (4)	**4.** (1)
5. (4)	**6.** (1)	**7.** (3)	**8.** (3)
9. (4)	**10.** (4)	**11.** (3)	**12.** (4)
13. (3)	**14.** (2)	**15.** (4)	**16.** (3)
17. (1)	**18.** (1)	**19.** (1)	**20.** (3)
21. (3)	**22.** (4)	**23.** (4)	**24.** (3)
25. (1)	**26.** (1)	**27.** (2)	**28.** (4)
29. (1)	**30.** (3)	**31.** (2)	**32.** (2)
33. (3)	**34.** (4)	**35.** (3)	**36.** (1)
37. (2)	**38.** (1)	**39.** (4)	**40.** (3)
41. (1)	**42.** (1)	**43.** (2)	**44.** (2)
45. (2)	**46.** (1)	**47.** (3)	**48.** (3)
49. (2)	**50.** (3)	**51.** (2)	**52.** (3)
53. (1)			

TYPE-II

1. (1)	**2.** (1)	**3.** (2)	**4.** (4)
5. (2)	**6.** (3)	**7.** (3)	**8.** (3)
9. (4)	**10.** (3)	**11.** (3)	**12.** (4)
13. (3)	**14.** (2)	**15.** (*)	**16.** (1)
17. (2)	**18.** (3)	**19.** (4)	**20.** (2)
21. (2)	**22.** (3)	**23.** (4)	**24.** (3)

TYPE-III

1. (3)	**2.** (2)	**3.** (1)	**4.** (1)
5. (2)	**6.** (2)	**7.** (2)	**8.** (3)

TYPE-IV

1. (4)	**2.** (3)	**3.** (2)	**4.** (4)
5. (4)	**6.** (1)	**7.** (3)	**8.** (1)
9. (3)	**10.** (2)	**11.** (1)	**12.** (2)
13. (3)	**14.** (1)	**15.** (3)	**16.** (3)
17. (2)	**18.** (2)	**19.** (3)	**20.** (2)
21. (1)	**22.** (4)	**23.** (1)	**24.** (3)
25. (3)			

TYPE-V

1. (4)	**2.** (2)	**3.** (4)	**4.** (1)
5. (3)	**6.** (4)	**7.** (2)	**8.** (1)
9. (1)	**10.** (2)	**11.** (3)	

TYPE-VI

1. (3)	**2.** (1)	**3.** (1)	**4.** (1)
5. (4)	**6.** (1)	**7.** (3)	**8.** (1)
9. (4)	**10.** (4)	**11.** (1)	**12.** (1)
13. (3)	**14.** (4)		

TYPE-VII

1. (1)	**2.** (1)	**3.** (1)	**4.** (4)
5. (3)	**6.** (4)	**7.** (1)	**8.** (2)
9. (3)	**10.** (2)	**11.** (3)	**12.** (4)
13. (2)	**14.** (4)	**15.** (2)	**16.** (1)
17. (3)	**18.** (3)	**19.** (3)	**20.** (1)
21. (1)	**22.** (2)	**23.** (2)	**24.** (*)
25. (3)	**26.** (1)	**27.** (4)	**28.** (2)
29. (1)	**30.** (1)		

EXPLANATIONS

TYPE-I

1. (2) Using Rule 1,

$$P = \frac{150 \times 100}{4} \times \frac{2}{1} = ₹\ 7500$$

2. (3) Using Rule 1,
Principal (P) = ₹ 1600
T = 2 years 3 months

$$= \left(2 + \frac{3}{12}\right)\text{yrs.} = \left(2 + \frac{1}{4}\right)\text{yrs.} = \frac{9}{4}\text{yrs.}$$

S.I = ₹ 252
R = % rate of interest per annum

$$\Rightarrow R = \frac{100 \times S.I.}{P \times t}$$

$$= \frac{100 \times 252}{1600 \times \frac{9}{4}}$$

Rate of interest = 7% per annum.

3. (4) If the principal be x and rate of interest be r% per annum, then
SI after 1 year = 920 – 880
= ₹ 40
$\therefore$ SI after 2 years = ₹ 80
$\Rightarrow$ 880 = x + 80
$\Rightarrow$ x = ₹ (880 – 80) = ₹ 800
Aliter : Using Rule 12,

$$P = \left(\frac{A_2T_1 - A_1T_2}{T_1 - T_2}\right)$$

$$= \left(\frac{920 \times 2 - 880 \times 3}{2 - 3}\right)$$

$$= \left(\frac{1840 - 2640}{-1}\right)$$

$$= \frac{-800}{-1} = ₹\ 800$$

4. (1) Using Rule 1,
If rate of interest be R% p.a. then,

$$SI = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$$

$$\therefore \frac{6000 \times 2 \times R}{100} + \frac{1500 \times 4 \times R}{100}$$

= 900
$\Rightarrow$ 120 R + 60R = 900
$\Rightarrow$ 180R = 900

$$\Rightarrow R = \frac{900}{180} = 5\%$$

5. (4) Using Rule 1,
Let the rate of interest per annum be r%
According to the question,

$$\frac{5000 \times 2 \times r}{100} + \frac{3000 \times 4 \times r}{100} = 2200$$

$\Rightarrow$ 100r + 120r = 2200
$\Rightarrow$ 220 r = 2200

$$\Rightarrow r = \frac{2200}{220} = 10\%$$

6. (1) Simple interest for 2 years
= ₹ (568 – 520) = ₹ 48
$\therefore$ Interest for 5 years

$$= ₹\ \frac{48}{2} \times 5 = ₹\ 120$$

Principal = ₹ (520 – 120) = ₹ 400
Aliter : Using Rule 12,

$$P = \left(\frac{A_2T_1 - A_1T_2}{T_1 - T_2}\right)$$

$$= \left(\frac{568 \times 5 - 520 \times 7}{5 - 7}\right)$$

$$= \left(\frac{2840 - 3640}{-2}\right)$$

$$= \frac{-800}{-2} = ₹\ 400$$

7. (3) Using Rule 1,
Simple interest gained from ₹ 500

$$= \frac{500 \times 12 \times 4}{100} = ₹\ 240$$

Let the other Principal be x.
S.I. gained = ₹ (480 – 240)
= ₹ 240

$$\therefore \frac{x \times 10 \times 4}{100} = 240$$

$$\Rightarrow x = \frac{240 \times 100}{40} = ₹\ 600$$

8. (3) Difference in rate

$$= \left(8 - 7\frac{3}{4}\right)\% = \frac{1}{4}\%$$

Let the capital be ₹ x.

$$\therefore \frac{1}{4}\% \text{ of } x = 61.50$$

$\Rightarrow$ x = 61.50 × 100 × 4
= ₹ 24600

9. (4) Using Rule 1,
Let the sum lent to C be x
According to the question,

$$\frac{2500\times7\times4}{100}+\frac{x\times7\times4}{100}=1120$$

or $2500 \times 28 + 28x = 112000$
or $2500 + x = 4000$
or $x = 4000 - 2500 = 1500$

10. (4) S.I. for $1\frac{1}{2}$ years
= ₹ (873 – 756) = ₹ 117
S.I. for 2 years

$$= ₹\left(117\times\frac{2}{3}\times2\right) = ₹\ 156$$

$\therefore$ Principal = 756 – 156 = ₹ 600
Now, P = 600, T = 2,
S.I. = 156

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

$$=\frac{100\times156}{600\times2}=13\%$$

Aliter : Using Rule 12,
Rate of interest

$$=\left(\frac{A_1-A_2}{A_2T_1-A_1T_2}\right)\times100$$

$$=\left(\frac{756-873}{873\times2-756\times\frac{7}{2}}\right)\times100$$

$$=\left(\frac{-117}{1746-2646}\right)\times100$$

$$=\left(\frac{-117}{-900}\right)\times100\ =\ 13\%$$

11. (3) Using Rule 1,

$$P=\frac{A\times100}{100+r\times t}$$

$$=\frac{7000\times100}{100+\frac{10}{3}\times5}$$

$$=\frac{7000\times100\times3}{350}=₹\ 6000$$

12. (4) Using Rule 1,
Let the principal be x.

$$S.I.\ =\frac{Principal\times Rate\times Time}{100}$$

$$\Rightarrow 5400=\frac{x\times12\times3}{100}$$

$$\Rightarrow x=\frac{5400\times100}{12\times3}=₹\ 15000$$

13. (3) Principal + S.I. for $\frac{5}{2}$ years
= ₹ 1012 ...(i)
Principal + S.I. for 4 years
= ₹ 1067.20 ...(ii)
Subtracting equation (i) from (ii)
S.I. for $\frac{3}{2}$ years = ₹ 55.20

$\therefore$ S.I. for $\frac{5}{2}$ years

$$=55.20\times\frac{2}{3}\times\frac{5}{2}=₹\ 92$$

$\therefore$ Principal
= ₹ (1012 – 92) = ₹ 920

$$\therefore \text{Rate}=\frac{92\times100}{920\times\frac{5}{2}}$$

$$=\frac{2\times92\times100}{920\times5}=4\%$$

Aliter : Using Rule 12,

$$R=\left(\frac{A_1-A_2}{A_2T_1-A_1T_2}\right)\times100$$

$$=\left(\frac{1012-1067.20}{1067.20\times\frac{5}{2}-1012\times4}\right)\times100$$

$$=\frac{-55.2}{(2668-4048)}\times100$$

$$=\frac{-55.2}{-1380}\times100$$

$$=4\%$$

14. (2) Principal + SI for 2 years
= ₹ 720 .... (i)
Principal + SI for 7 years
= ₹ 1020 .....(ii)
Subtracting equation (i) from (ii) get,
SI for 5 years
= ₹ (1020 – 720) = ₹ 300
$\therefore$ SI for 2 years

$$=₹\ 300\times\frac{2}{5}=₹\ 120$$

$\therefore$ Principal
= ₹ (720 – 120) = ₹ 600
Aliter : Using Rule 12,

$$P\ =\left(\frac{A_2T_1-A_1T_2}{T_1-T_2}\right)$$

$$=\left(\frac{1020\times2-720\times7}{2-7}\right)$$

$$=\left(\frac{2040-5040}{-5}\right)$$

$$=\frac{-3000}{-5}=₹\ 600$$

15. (4) Using Rule 1,
The sum of money will give ₹ 365 as simple interest in a year.

$$\Rightarrow S.I.=\frac{PRT}{100}$$

$$\Rightarrow 365=\frac{P\times5\times1}{100}$$

$$\Rightarrow P=\frac{365\times100}{5}=₹\ 7300$$

16. (3) Using Rule 1,
Let the sum be x.
Using formula, $I=\frac{PRT}{100}$ we have

$$\frac{x\times\frac{15}{12}\times\frac{15}{2}}{100}-\frac{x\times\frac{8}{12}\times\frac{25}{2}}{100}$$

$$=32.50$$

$$\Rightarrow\frac{25x}{2400}=32.50$$

$$\Rightarrow x=\frac{32.50\times2400}{25}=3120$$

$\therefore$ Required sum = ₹ 3120

17. (1) Let each instalment be x
Then,

$$\left(x+\frac{x\times5\times1}{100}\right)+\left(x+\frac{x\times5\times2}{100}\right)$$

$$+\left(x+\frac{x\times5\times3}{100}\right)+x=6450$$

$$\Rightarrow\left(x+\frac{x}{20}\right)+\left(x+\frac{x}{10}\right)+$$

$$\left(x+\frac{3x}{20}\right)+x=6450$$

$$\Rightarrow\frac{21x}{20}+\frac{11x}{10}+\frac{23x}{20}+x=6450$$

$$\Rightarrow\frac{21x+22x+23x+20x}{20}$$

$$=6450$$

$$\Rightarrow\frac{86x}{20}=6450$$

$\Rightarrow x = \frac{6450 \times 20}{86}$ = ₹ 1500

Aliter : Using Rule 10,
Equal instalment

$= \frac{6450 \times 200}{4[200 + (4-1) \times 5]}$

$= \frac{6450 \times 200}{4(215)}$

$= \frac{6450 \times 50}{215}$ = ₹ 1500

18. (1) Using Rule 1,
Interest = ₹ (81–72)= ₹ 9
Let the time be t years.

Then, $9 = \frac{72 \times 25 \times t}{4 \times 100}$

$\Rightarrow t = \frac{9 \times 400}{72 \times 25}$ = 2 years.

19. (1) Using Rule 1,
Time from 11 May to 10 September, 1987
= 21 + 30 + 31 + 31 + 10
= 123 days

$\therefore$ Time = 123 days = $\frac{123}{365}$ year

$\therefore$ S.I. = $\frac{7300 \times 123 \times 5}{365 \times 100}$ = ₹ 123

20. (3) Using Rule 1,
Case I :

S.I. = $\frac{5000 \times 2 \times 4}{100}$ = ₹ 400

Case II :

S.I. = $\frac{5000 \times 25 \times 2}{100 \times 4}$ = ₹ 625

$\therefore$ Gain = ₹ (625 – 400) = ₹ 225

21. (3) Using Rule 1,
Let the sum lent at 4% = Rs.x
$\therefore$ Amount at 5%= (16000 – x)
According to the question,

$\frac{x \times 4 \times 1}{100} + \frac{(16000 - x) \times 5 \times 1}{100}$

= 700
$\Rightarrow 4x + 80000 - 5x = 70000$
$\Rightarrow x = 80000 - 70000$
= ₹ 10000

22. (4) Using Rule 1,
After 10 years,

SI = $\frac{1000 \times 5 \times 10}{100}$ = ₹ 500

Principal for 11th year
= 1000 + 500 = ₹ 1500
SI = ₹ (2000 – 1500) = ₹ 500

$\therefore$ T = $\frac{\text{SI} \times 100}{\text{P} \times \text{R}} = \frac{500 \times 100}{1500 \times 5}$

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

$\therefore$Total time = $10 + 6\frac{2}{3}$

= $16\frac{2}{3}$ years

23. (4)
P + S.I. for 5 years = 5200 ..(i)
P + SI for 7 years = 5680 ...(ii)
On subtracting equation (i) from (ii),
SI for 2 years = 480
$\therefore$ SI for 1 year = ₹ 240
$\therefore$ From equation (i),
$P + 5 \times 240 = 5200$
$\Rightarrow$ P = 5200 – 1200 = ₹ 4000

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

= $\frac{240 \times 100}{1 \times 4000}$ = 6%

Aliter : Using Rule 12,

R = $\left(\frac{A_1 - A_2}{A_2T_1 - A_1T_2}\right) \times 100$

= $\left(\frac{5200 - 5680}{5680 \times 5 - 5200 \times 7}\right) \times 100$

= $\frac{-480}{28400 - 36400} \times 100$

= $\frac{-480}{-8000} \times 100$

= 6%

24. (3) Using Rule 1,
S.I. = 956 – 800 = Rs. 156

$\therefore$ Rate = $\frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

= $\frac{156 \times 100}{800 \times 3}$ = 6.5% per annum
$\therefore$ New rate = 10.5%

$\therefore$ S.I. = $\frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

= $\frac{800 \times 3 \times 10.5}{100}$ = ₹ 252

$\therefore$ Amount = 800 + 252 = ₹ 1052

25. (1) Using Rule 1,
Let the rate of interest be R per cent per annum.

$\therefore \frac{400 \times 2 \times R}{100} + \frac{550 \times 4 \times R}{100}$

$+ \frac{1200 \times 6 \times R}{100} = 1020$

$\Rightarrow 8R + 22R + 72R = 1020$
$\Rightarrow 102R = 1020$

$\Rightarrow R = \frac{1020}{102} = 10\%$

26. (1) Using Rule 1,

$4200 = \frac{29400 \times 6 \times R}{100}$

$\Rightarrow R = \frac{4200}{294 \times 6} = \frac{50}{21} = 2\frac{8}{21}\%$

27. (2) Using Rule 1,
Let the amount lent at 4% be x
$\therefore$ Amount lent at 5% = (60000 – x)
According to the question,

$\frac{(60000 - x) \times 5 \times 1}{100} + \frac{x \times 4 \times 1}{100}$

= 2560
$\Rightarrow$ 300000 – 5x + 4x = 256000
$\Rightarrow$ x = 300000 – 256000
= ₹ 44000

28. (4) Principal + interest for 8 years= ₹ 2900... (i)
Principal + interest for 10 years
= ₹ 3000 ... (ii)
Subtracting equation (i) from (ii)
Interest for 2 years = ₹ 100
$\therefore$ Interest for 8 years

= $\frac{100}{2} \times 8$ = ₹ 400

From equation (i),
Principal = ₹ (2900 – 400)
= ₹ 2500

$\therefore$ Rate = $\frac{\text{S.I} \times 100}{\text{Time} \times \text{Principal}}$

= $\frac{400 \times 100}{8 \times 2500} = 2\%$

Aliter : Using Rule 12,

R = $\left(\frac{A_1 - A_2}{A_2T_1 - A_1T_2}\right) \times 100$

$= \left(\frac{2900-3000}{3000\times 8-2900\times 10}\right)\times 100$

$= \left(\frac{-100}{24000-29000}\right)\times 100$

$= \frac{-100}{-5000}\times 100$

$= 2\%$

29. (1) Using Rule 1,

$\text{Time} = \frac{\text{SI}\times 100}{\text{Principal}\times\text{Rate}}$

$= \frac{1080\times 100}{3000\times 12} = 3 \text{ years}$

30. (3) Interest for 1 year
= ₹ (925 – 850) = ₹ 75
∴ If a sum becomes a_1 in t_1 years and a_2 in t_2 years then rate of interest $= \frac{100(a_2-a_1)}{(a_1t_2-a_2t_1)}\%$

$= \frac{100(925-850)}{850\times 4-3\times 925} = \frac{7500}{625} = 12\%$

∴ $\text{Principal} = \frac{\text{SI}\times 100}{\text{Time}\times\text{Rate}}$

$= \frac{75\times 100}{1\times 12} = ₹\ 625$

Aliter : Using Rule 12,

$P = \left(\frac{A_2T_1-A_1T_2}{T_1-T_2}\right)$

$= \frac{925\times 3-850\times 4}{3-4}$

$= \frac{2775-3400}{-1}$

$= \frac{-625}{-1} = ₹\ 625$

31. (2) Using Rule 1,
S.I. = 2641.20 – 1860
= ₹ 781.2

$\text{Time} = \frac{\text{S.I.}\times 100}{\text{Principal}\times\text{Rate}}$

$= \frac{781.2\times 100}{1860\times 12} = 3.5 = 3\frac{1}{2}$ years

32. (2) Using Rule 18 of 'percentage' chapter,
Present population

$= 10000\left(1-\frac{20}{100}\right)^2$

$= 10000\times\frac{4}{5}\times\frac{4}{5} = 6400$

33. (3) Using Rule 1,
Annual interest
= 365 × 2 = ₹ 730

$\text{Principal} = \frac{\text{S.I.}\times 100}{\text{Time}\times\text{Rate}}$

$= \frac{730\times 100}{1\times 5} = ₹\ 14600$

34. (4) If principal = x and rate = r% per annum, then

$1380 = x + \frac{x\times 3\times r}{100}$ .....(i)

$1500 = x + \frac{x\times 5\times r}{100}$ .....(ii)

S.I. for two years = 1500 – 1380
= ₹ 120

$\therefore \frac{x\times 2\times r}{100} = 120$

$\therefore \frac{xr}{100} = 60$ .....(iii)

∴ From equation (i)
$1380 = x + 60\times 3$
$\Rightarrow x = 1380 - 180 = ₹\ 1200$
From equation (iii)

$\frac{1200\times r}{100} = 60$

$\Rightarrow r = \frac{6000}{1200} = 5\%$ per annum

Aliter : Using Rule 12,

$R = \left(\frac{A_1-A_2}{A_2T_1-A_1T_2}\right)\times 100\%$

$= \left(\frac{1380-1500}{1500\times 3-1380\times 5}\right)\times 100\%$

$= \frac{-120}{4500-6900}\times 100$

$= \frac{-120}{-2400}\times 100$

$= 5\%$

35. (3) S.I. for 1 year
= 14250 – 12900 = Rs. 1350
S.I. for 4 years = 1350 × 4
= ₹ 5400
∴ Principal = 12900 – 5400
= ₹ 7500

∴ $\text{Rate} = \frac{\text{S.I.}\times 100}{\text{Principal}\times\text{Time}}$

$= \frac{5400\times 100}{7500\times 4}$

= 18% per annum

Aliter : Using Rule 12,

$R = \left(\frac{A_1-A_2}{A_2T_1-A_1T_2}\right)\times 100$

$= \left(\frac{12900-14250}{14250\times 4-12900\times 5}\right)\times 100$

$= \frac{-1350}{57000-64500}\times 100$

$= \frac{1350}{7500}\times 100$

$= 18\%$

36. (1) Using Rule 1,
Required time = t years

$\text{S.I.} = \frac{\text{Principal}\times\text{Rate}\times\text{Time}}{100}$

$\therefore \frac{6000\times 4\times 5}{100} = \frac{8000\times 3\times t}{100}$

$\Rightarrow 6000\times 4\times 5 = 8000\times 3\times t$

$\therefore t = \frac{6000\times 4\times 5}{8000\times 3} = 5$ years

37. (2) Using Rule 1,

$\text{Principal} = \frac{\text{S.I.}\times 100}{\text{Time}\times\text{Rate}}$

$= \frac{1\times 100}{\frac{1}{365}\times 5} = \frac{365\times 100}{5}$

= Rs. 7300

38. (1) S.I. for 5 years
= Rs. (1020 – 720) = Rs. 300
∴ S.I. for 2 years

$= \frac{300}{5}\times 2 = \text{Rs. } 120$

∴ Principal = Rs. (720 – 120)
= Rs. 600

39. (4) Using Rule 1,
Number of days from 5th January to 31st May = 26 + 28 + 31 + 30 + 31 = 146
∴ S.I.

$= \frac{\text{Principal}\times\text{Time}\times\text{Rate}}{100}$

$= \frac{36000\times 146\times 9.5}{365\times 100}$

= Rs. 1368

40. (3) $\frac{\text{Principal}}{\text{Interest}} = \frac{10}{3}$

$\Rightarrow \frac{\text{Interest}}{\text{Principal}} = \frac{3}{10}$

$\therefore$ Time $= \frac{\text{S.I} \times 100}{\text{Principal} \times \text{Rate}}$

$= \frac{3}{10} \times \frac{100}{6} = 5$ years

41. (1) Principal

$= \frac{\text{S.I.} \times 100}{\text{Time} \times \text{Rate}}$

$= \frac{60 \times 100}{5 \times 6} = $ Rs. 200

42. (1) According to the question,
S.I. for 2 years 6 months
= Rs. (5500 – 4000)

$\Rightarrow$ S.I. for $\frac{5}{2}$ years = Rs. 1500

$\therefore$ S.I. for 1 year $= \frac{1500 \times 2}{5}$
= Rs. 600
$\therefore$ S.I. for 2 years = Rs. 1200
$\therefore$ Principal = Rs. (4000 – 1200)
= Rs. 2800

$\therefore$ Rate $= \frac{\text{S.I.} \times 100}{\text{Pricipal} \times \text{Time}}$

$= \frac{1200 \times 100}{2800 \times 2} = \frac{150}{7}$

$= 21\frac{3}{7}\%$ per annum.

43. (2) Principal $= \frac{\text{S.I.} \times 100}{\text{Time} \times \text{Rate}}$

$= \frac{840 \times 100}{8 \times 5} = $ Rs. 2100

Case II,
S.I. = Rs. 840
Principal = Rs. 2100
Time = 5 years

Rate $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{840 \times 100}{2100 \times 5} = 8\%$ per annum

44. (2) Let first part be x.
$\therefore$ Second part
= Rs. $(2800 - x)$
According to the question,

S.I. $= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$\therefore \frac{x \times 5 \times 9}{100}$

$= \frac{(2800 - x) \times 6 \times 10}{100}$

$\Rightarrow 3x = 4 \times 2800 - 4x$
$\Rightarrow 7x = 4 \times 2800$

$\Rightarrow x = \frac{4 \times 2800}{7} = $ Rs. 1600

$\therefore$ Second part
= Rs. (2800 – 1600) = Rs. 1200

45. (2) According to the question,

$\frac{\text{S.I.}}{\text{Principal}} = \frac{2}{5}$

Rate $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{2}{5} \times \frac{100}{5} = 8\%$ per annum
= 0.08 per annum

46. (1) Rate $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{280 \times 100}{400 \times 10}$
= 7% per annum

47. (3) Rate $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{\frac{1}{100} \times 100}{1 \times \frac{1}{12}} = 12\%$ p.a.

48. (3) S.I.

$= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \text{Rs.} \left(4000 \times \frac{18}{12} \times \frac{12}{100}\right)$

= Rs. 720

49. (2) Time $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Rate}}$

$= \frac{1080 \times 100}{3000 \times 12} = 3$ years

50. (3) Let the principal be Rs. x.
According to the question,
x + S.I. for 2 years
= Rs. 5182 ...(i)
x + S.I. for 3 years
= Rs. 5832 ...(ii)
By equation (ii) – (i),
S.I. for 1 year
= Rs. (5832 – 5182)
= Rs. 650
$\therefore$ S.I. for 2 years
= Rs. (2 × 650) = Rs. 1300
$\therefore$ Principal
= Rs. (5182 – 1300)
= Rs. 3882

51. (2) Principal $= \frac{\text{S.I.} \times 100}{\text{Time} \times \text{Rate}}$

$= \frac{\text{R} \times 100}{2 \times \text{R}} = $ Rs. 50

52. (3)

S.I. $= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \frac{2000 \times 2 \times 5}{100} = $ Rs. 200

$\therefore$ Required amount
= Rs. (2000 + 200)
= Rs. 2200

53. (1) S.I. = Amount – Principal
= Rs. (6900 – 6000)
= Rs. 900

$\therefore$ Rate $= \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{900 \times 100}{6000 \times 3}$
= 5% per annum

TYPE-II

1. (1) Principal = P

Amount $= \frac{7p}{6}$

S.I. $= \frac{7p}{6} - \text{P} = \frac{P}{6}$

$\therefore R = \frac{S.I \times 100}{P \times T} = \frac{P \times 100}{6 \times p \times 3}$

$= \frac{50}{9} = 5\frac{5}{9}\%$

Aliter : Using Rule 3,

$\text{R}\% = \frac{\left(\frac{7}{6} - 1\right) \times 100\%}{3}$

$= \frac{1}{18} \times 100\%$

$= \frac{50}{9}\%$

$= 5\frac{5}{9}\%$

2. (1) Let the principal be Re.1

$\therefore$ S.I. $= \frac{41}{40} - 1 = \frac{1}{40}$

Now, rate $= \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{\frac{1}{40} \times 100}{1 \times \frac{1}{4}} = \frac{100 \times 4}{40} = 10\%$

Aliter : Using Rule 3,

$R = \frac{\left(\frac{41}{40} - 1\right) \times 100\%}{\frac{1}{4}}$

$= \frac{1}{40} \times 4 \times 100\%$

$= 10\%$

3. (2) **Case-I**

Let the principal be x

Amount = $3x$

$\therefore$ Interest = $2x$

Time = 20 years

$\therefore I = \frac{PRT}{100} \Rightarrow 2x = \frac{x \times R \times 20}{100}$

$\Rightarrow R = 10\%$

Case-II

$I = x$

$P = x$

$R = 10$

$T = ?$

$\therefore I = \frac{PRT}{100} \Rightarrow x = \frac{x \times 10 \times T}{100}$

$\therefore T = 10$ years.

Aliter : Using Rule 3,

$R\% = \frac{(3-1)}{20} \times 100\%$

$R\% = 10\%$

Now, $T = \frac{(n-1)}{R}$ years

$T = \frac{2-1}{10} \times 100$

$\boxed{T = 10 \text{ years}}$

4. (4) Using Rule 1,

Let P be the principal and R% rate of interest.

$\therefore$ S.I. $= \frac{PR \times 10}{100} = \frac{PR}{10}$

According to the question,

$\frac{PR}{10} = \left(P + \frac{PR}{10}\right) \times \frac{2}{5}$

$\Rightarrow \frac{R}{10} = \left(1 + \frac{R}{10}\right) \times \frac{2}{5}$

$\Rightarrow \frac{R}{10} = \frac{2}{5} + \frac{R}{25}$

$\Rightarrow \frac{R}{10} - \frac{R}{25} = \frac{2}{5}$

$\Rightarrow \frac{5R - 2R}{50} = \frac{2}{5}$

$\Rightarrow \frac{3R}{50} = \frac{2}{5}$

$\Rightarrow R = \frac{50 \times 2}{3 \times 5} = \frac{20}{3} = 6\frac{2}{3}\%$

5. (2) Using Rule 1,

SI = ₹ (7200–6000)

= ₹ 1200

$\therefore$ SI $= \frac{PRT}{100}$

$\Rightarrow 1200 = \frac{6000 \times R \times 4}{100}$

$\Rightarrow R = \frac{1200 \times 100}{6000 \times 4} = 5\%$

New rate of R = 5×1.5 = 7.5%

Then, SI $= \frac{6000 \times 7.5 \times 5}{100}$

= ₹ 2250

$\therefore$ Amount = ₹ (6000 + 2250)

= ₹ 8250

6. (3) Let the principal be x.

Case-I

$2x = \frac{x \times R \times 15}{100}$

$\Rightarrow R = \frac{2 \times 100}{15} = \frac{40}{3}\%$

Case-II

SI = $4x$

$\therefore 4x = \frac{x \times 40 \times T}{300}$

$\Rightarrow T = \frac{4 \times 300}{40} = 30$ years

Aliter : Using Rule 3,

$R = \frac{(3-1)}{15} \times 100\%$

$= \frac{2}{15} \times 100\%$

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

$= \frac{40}{3}\%$

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

$= \frac{(5-1)}{\frac{40}{3}} \times 100$

= 30 years.

7. (3) Let the principal be x.

$\therefore$ Amount = $2x$

$\therefore$ Interest = $(2x - x) = x$

$\therefore$ Rate = $\frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{x \times 100}{x \times 12} = \frac{25}{3} = 8\frac{1}{3}\%$

Aliter : Using Rule 3,

$R = \frac{(2-1)}{12} \times 100\%$

$R = \frac{25}{3}\%$

$R = 8\frac{1}{3}\%$

8. (3) Let the principal be x

$\therefore$ Principal + SI = $\frac{7x}{4}$

$\therefore$ SI $= \frac{7x}{4} - x = \frac{3x}{4}$

Rate $= \frac{\text{SI} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{3x \times 100}{4 \times x \times 4} = 18\frac{3}{4}\%$

Aliter : Using Rule 3,

$R = \frac{\left(\frac{7}{4} - 1\right)}{4} \times 100\%$

$= \frac{3}{16} \times 100\%$

$= \frac{75}{4}\%$

$R = 18\frac{3}{4}\%$

9. (4) The sum gets doubled in 5 years and tripled in 12 years. Clearly rate of interest for 12 years will be lower.
Let Principal be x.

then, Rate $= \frac{SI \times 100}{Principal \times Time}$

$= \frac{2x \times 100}{x \times 12} = \frac{50}{3} = 16\frac{2}{3}\%$

Aliter : Using Rule 3,

$R_1 = \frac{(2-1)}{5} \times 100\%$

$= 20\%$

$R_2 = \frac{(3-1)}{12} \times 100\%$

$= 16\frac{2}{3}\%$

$\Rightarrow$ Lower rate of interest $= 16\frac{2}{3}\%$

10. (3) TIme $= \frac{SI \times 100}{Principal \times Rate}$

$= \frac{x \times 100}{x \times \frac{25}{4}} = 16$ years

Aliter : Using Rule 3,

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

$= \frac{(2-1)}{\frac{25}{4}} \times 100$ years

$= 16$ years.

11. (3) If principal be x, interest $= x$ and rate = r% p.a. then

Rate $= \frac{SI \times 100}{Principal \times Time}$

$= \frac{x \times 100}{x \times 10} = 10\%$

Now, $p = x$, interest $= 2x$

Then, time $= \frac{SI \times 100}{Principal \times Rate}$

$= \frac{2x \times 100}{x \times 10} = 20$ years

Aliter : Using Rule 3,

$R = \frac{(2-1)}{10} \times 100\%$

$R = 10\%$

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

$= \frac{3-1}{10} \times 100$

$= 20$ years.

12. (4) If the principal be x, the amount $= 2x$

$\therefore$ SI $= x$

$\therefore$ Time $= \frac{SI \times 100}{Principal \times Rate}$

$= \frac{x \times 100}{x \times 15} = \frac{20}{3} = 6\frac{2}{3}$ years

Aliter : Using Rule 3,

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

$= \left(\frac{2-1}{15}\right) \times 100$

$= \frac{100}{15} = \frac{20}{3}$ Years

$= 6\frac{2}{3}$ years

13. (3) If the principal be ₹ 100 then S.I. = ₹ 100.

$\therefore$ Time $= \frac{S.I. \times 100}{Principal \times Rate}$

$= \frac{100 \times 100}{100 \times 12} = \frac{25}{3}$ years

$= 8$ years 4 months

Aliter : Using Rule 3,

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

$= \frac{(2-1)}{12} \times 100\%$

$= \frac{100}{12} = \frac{25}{3}$ years.

$= 8\frac{1}{3}$ years

$= 8$ years, 4 months.

14. (2) Principal = Rs. x

Amount = Rs. $2x$

$\therefore$ Interest $= 2x - x$

$=$ Rs. x

$\therefore$ Rate $= \frac{S.I. \times 100}{Principal \times Time}$

$= \frac{x \times 100}{x \times 8} = \frac{25}{2}$

$= 12.5$ % per annum

Aliter : Using Rule 3,

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

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

$= 12.5\%$

15. (*) Principal = Rs. x

Interest = Rs. x

Rate $= \frac{S.I \times 100}{Principal \times Time}$

$= \frac{x \times 100}{x \times 16} = \frac{25}{4}$ % per annum

Case II,

Interest = Rs. $2x$

$\therefore$ Time $= \frac{S.I \times 100}{Principal \times Rate}$

$= \frac{2x \times 100 \times 4}{x \times 25} = 32$ years

Aliter : Using Rule 3,

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

$= \frac{(2-1)}{16} \times 100\%$

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

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

Now, $T = \frac{(n-1)}{R} \times 100$

$= \frac{(3-1)}{\frac{25}{4}} \times 100$

$= \frac{800}{25} = 32$ years.

16. (1) According to the question,
If principal be Rs. x, then
S.I. = Rs. x

$\therefore$ Time $= \frac{S.I. \times 100}{Principal \times Rate}$

$= \frac{x \times 100}{x \times \frac{25}{4}} = \frac{400}{25} = 16$ years

Aliter : Using Rule 3,

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

$$= \frac{2-1}{\frac{25}{4}}\times 100$$

$$= \frac{400}{25} = 16 \text{ years.}$$

17. (2) Using Rule 1,
Rate = R% per annum

$$\therefore \text{ Time} = \frac{R}{2} \text{ years}$$

$$\therefore \text{ Rate} = \frac{\text{S.I. } \times 100}{\text{Principal} \times \text{Time}}$$

$$\Rightarrow R = \frac{8}{25} \times \frac{100}{\frac{R}{2}}$$

$$\Rightarrow R^2 = \frac{8\times 200}{25} = 64$$

$$\Rightarrow R = \sqrt{64} = 8\% \text{ per annum}$$

18. (3) Case I,
Interest = Principal

$$\text{Rate} = \frac{\text{Interest } \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{100}{7}\% \text{ per annum}$$

Case II,
Interest = 3 × Principal

$$\text{Time} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{3\times 100}{\frac{100}{7}} = 3 \times 7 = 21 \text{ years}$$

19. (4) Principal = Rs. P and time = T years

$$\therefore \text{S.I.} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$$

According to the question,

$$\therefore P + \frac{PT\times 5}{100} = 2200$$

$$\Rightarrow P + \frac{PT}{20} = 2200 \text{ ....(i)}$$

Again, $\frac{PT \times 8}{100} - \frac{PT\times 5}{100}$

$= 2320 - 2200$

$$\Rightarrow \frac{3PT}{100} = 120$$

$$\Rightarrow PT = \frac{120\times 100}{3} = 4000 \text{ ...(ii)}$$

$\therefore$ From equation (i),

$$P + \frac{4000}{20} = 2200$$

$\Rightarrow P = 2200 - 200 = \text{Rs. } 2000$
$\therefore$ From equation (ii),
PT = 4000

$$\Rightarrow T = \frac{4000}{2000} = 2 \text{ years}$$

Alternative Method

Difference in rates
$= 8 - 5 = 3\%$
$\because$ 3% ≡ 2320 − 2200 = 120

$$\therefore 5\% \equiv \frac{120}{3}\times 5 = 200$$

$\therefore$ Principal = Rs. (2200 − 200)
= Rs. 2000

$$\therefore \text{Time} = \frac{200\times 100}{2000\times 5} = 2 \text{ years}$$

20. (2) Let principal be Rs. x.
$\therefore$ Amount = Rs. $2x$
$\therefore$ Interest = Rs. $(2x - x)$
= Rs. x

$$\therefore \text{Rate} = \frac{\text{S.I.}\times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{x\times 100}{x\times 15} = \frac{20}{3}$$

$$= 6\frac{2}{3}\% \text{ per annum}$$

21. (2) Principal = Rs. x
Interest = Rs. x
Time = 6 years

$$\therefore \text{Rate} = \frac{\text{Interest } \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{x\times 100}{x\times 16} = \frac{50}{3}\% \text{ per annum}$$

Case II,

$$\text{Interest} = \frac{x\times 12\times 50}{100\times 3} = \text{Rs. } 2x$$

i.e., Amount is thrice the principal.

22. (3) Principal = Rs. x (let)
$\therefore$ Amount = Rs. $5x$
Interest = Rs. $(5x - x)$ = Rs. $4x$

$$\therefore \text{Rate} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{4x\times 100}{x\times 8} = 50\% \text{ per annum}$$

23. (4) Let principal be Rs. x.
$\therefore$ Amount = Rs. $2x$
Interest = Rs. $(2x - x)$ = Rs. x

$$\therefore \text{Rate} = \frac{\text{S.I.}\times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{x\times 100}{x\times 8} = \frac{25}{2}$$

$$= 12\frac{1}{2}\% \text{ per annum}$$

24. (3) According to the question,
Principal = Rs. x.
Interest = Rs. x.

$$\text{Time} = \frac{50}{3} \text{ years}$$

$$\therefore \text{Rate} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{x\times 100}{x\times \frac{50}{3}} = \frac{100\times 3}{50}$$

= 6% per annum

TYPE-III

1. (3) Let the principal be x

$$\therefore \text{Interest} = \frac{2}{5}x$$

Rate = 8% per annum

$$\therefore \text{Time} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Rate}}$$

$$= \frac{\frac{2}{5}x\times 100}{x\times 8} = \frac{40}{8} = 5 \text{ years}$$

Aliter : Using Rule 5,

Here, $n = \frac{2}{5}$ and R = 8%

$\Rightarrow RT = (n \times 100)$

$$T = \frac{n\times 100}{R}$$

$$T = \frac{2}{5}\times\frac{100}{8}$$

T = 5 years

2. (2) Let Prinicpal = ₹ 100

S.I. $= 100 \times \frac{1}{5} =$ ₹ 20

Rate $= \frac{20 \times 100}{100 \times 4} = 5\%$

Aliter : Using Rule 5,

Here, $n = \frac{1}{5}$, T = 4 years.

$R = \frac{n \times 100}{T}$

$R = \frac{1}{5} \times \frac{100}{4}$

R = 5%

3. (1) Rate $= \frac{SI \times 100}{Principal \times Time}$

$= \frac{9}{25} \times \frac{100}{6} = 6\%$ per annum

Aliter : Using Rule 5,

Here, $n = \frac{9}{25}$, T = 6 years.

$R = \frac{n \times 100}{T}$

$R = \frac{9}{25} \times \frac{100}{6}$

R = 6%

4. (1) $\frac{\text{Simple interest}}{\text{Principal}} = \frac{1}{4}$

$\therefore$ Rate $= \frac{S.I. \times 100}{Principal \times Time}$

$= \frac{1 \times 100}{4 \times 5} = 5\%$ per annum

Aliter : Using Rule 5,

Here, $n = \frac{1}{4}$, T = 5 years

$R = \frac{n \times 100}{T}$

$= \frac{1}{4} \times \frac{100}{5} = R = 5\%$

5. (2) $\frac{\text{Interest}}{\text{Principal}} = \frac{3}{8}$

$\therefore$ Rate $= \frac{S.I. \times 100}{Principal \times Time}$

$= \frac{3}{8} \times \frac{100}{\frac{25}{4}}$

$= \frac{3}{8} \times \frac{400}{25} = 6\%$ per annum

Aliter : Using Rule 5,

Here, $n = \frac{3}{8}$, T = $\frac{25}{4}$ years.

$R = \frac{n \times 100}{T}$

$= \frac{3}{8} \times \frac{100}{\frac{25}{4}}$

R = 6%

6. (2) Using Rule 1,

S.I. $= \frac{Principal \times Time \times Rate}{100}$

$\therefore 1200 + \frac{1200 \times 7 \times r}{12 \times 100}$

= Amount (A)

$\Rightarrow 1200 + 7r = A$ .....(i)

and, $1016 + \frac{1016 \times 5 \times r}{2 \times 100} = A$

$\therefore 1016 + 25.4r = A$ ...(ii)

$\therefore 1016 + 25.4r = 1200 + 7r$

$\Rightarrow 25.4r - 7r = 1200 - 1016$

$\Rightarrow 18.4r = 184 \Rightarrow r = \frac{184}{18.4}$

= 10% per annum

7. (2) Amount after 10 years

$= P\left(1 + \frac{RT}{100}\right) = P\left(1 + \frac{R \times 10}{100}\right)$

$= \text{Rs. } P\left(1 + \frac{R}{10}\right)$

$\therefore$ Interest = Rs. $P\left(1 + \frac{R}{10}\right) \times \frac{2}{5}$

$\therefore$ Rate= $\frac{S.I \times 100}{Principal \times Time}$

$\Rightarrow R = \frac{P\left(1 + \frac{R}{10}\right) \times \frac{2}{5} \times 100}{P \times 10}$

$\Rightarrow R = 4\left(1 + \frac{R}{10}\right)$

$\Rightarrow \frac{R}{4} = 1 + \frac{R}{10}$

$\Rightarrow \frac{R}{4} - \frac{R}{10} = 1$

$\Rightarrow \frac{5R - 2R}{20} = 1$

$\Rightarrow 3R = 20$

$\Rightarrow R = \frac{20}{3} = 6\frac{2}{3}\%$

Aliter : Using Rule 5,

Here, S.I. $= \frac{2}{5}$ amount

S.I. $= \frac{2}{5}$ (P + S.I.)

$\Rightarrow$ S.I. $= \frac{2}{5}$ S.I. + $\frac{2}{5}$ P

$\Rightarrow \frac{3}{5}$ S.I. $= \frac{2}{5}$P

S.I. $= \frac{2}{3}$P

Now, n $= \frac{2}{3}$, T = 10 years.

$\Rightarrow$ R $= \frac{n \times 100}{T}$

$= \frac{2}{3} \times \frac{100}{10}$

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

8. (3) Rate of interest

= r % per annum

S.I. $= \frac{Principal \times Time \times Rate}{100}$

According to the question,

$\frac{3200 \times 5 \times r}{100 \times 2} - \frac{3000 \times 5 \times r}{200} = 40$

$\Rightarrow 80r - 75r = 40$

$\Rightarrow 5r = 40 \Rightarrow r = \frac{40}{5}$

= 8% per annum

Aliter : Using Rule 13,

Here, P_1 = Rs. 3000, R_1 = R, $T_1 = \frac{5}{2}$ years

P_2 = Rs. 3200,

$R_2 = R$, $T_2 = \frac{5}{2}$ years

Difference S.I. = Rs. 40

$\Rightarrow$ $40 = \frac{3200 \times R \times \frac{5}{2} - 3000 \times R \times \frac{5}{2}}{100}$

$4000 = 8000\,R - 7500\,R$

$R = 8\%$

TYPE-IV

1. (4) According to question,
Interest of one year = ₹ 42
Rate = 5% and Time = 1 year

$\therefore$ Principal $= \frac{\text{Interest} \times 100}{\text{Rate} \times \text{Time}}$

$= \frac{42 \times 100}{5 \times 1} =$ ₹ 840

Aliter : Using Rule 13,
$P_1 = P$, $R_1 = 5\%$, $T_1 = 3$years.
$P_2 = P$, $R_2 = 5\%$, $T_2 = 4$ years.
S.I.= 42

$42 = \frac{20P - 15P}{100}$

$P = 42 \times 20$

$P =$ ₹ 840

2. (3) Let r_1, and r_2 be the required rate of interest
Then,

$13.50 = \frac{1500 \times 3 \times r_1}{100} - \frac{1500 \times 3 \times r_2}{100}$

$= \frac{4500}{100}(r_1 - r_2)$

$r_1 - r_2 = \frac{135}{450} = \frac{27}{90}$

$= \frac{3}{10} = 0.3\%$

Aliter : Using Rule 13,
$P_1 =$ Rs. 1500, R_1, $T_1 = 3$ years.
$P_2 =$ Rs. 1500, R_2, $T_2 = 3$ years.
S.I. = Rs. 13.50
13.50

$= \frac{1500 \times R_2 \times 3 - 1500 \times R_1 \times 3}{100}$

$\frac{1350}{100} = \frac{4500(R_2 - R_1)}{100}$

$R_2 - R_1 = \frac{1350}{4500} = \frac{27}{90}$

$= \frac{3}{10} = 0.3\%$

3. (2) Using Rule 1,
We know that

$S.I. = \frac{PRT}{100}$

According to question,

$S.I. = \frac{4}{9}P$

& R = T (numerically)

$\therefore \frac{4}{9}P = \frac{P \times R \times R}{100}$

$\therefore R^2 = \frac{400}{9}$

$R = \sqrt{\frac{400}{9}} = \frac{20}{3} = 6\frac{2}{3}\%$

4. (4) Let the sum be x

$\frac{x \times 5 \times 15}{100 \times 12} - \frac{x \times 4 \times 8}{100 \times 12} = 129$

$\Rightarrow \frac{x}{100 \times 12}(75 - 32) = 129$

$\Rightarrow x = \frac{129 \times 1200}{43} =$ ₹ 3600

Aliter : Using Rule 13,
$P_1 = P$, $R_1 = 4\%$, T_1

$= 8$ months $= \frac{8}{12}$ years

$P_2 = P$, $R_2 = 5\%$, T_2

$= 15$ month $= \frac{15}{12}$ years

S.I. = ₹ 129

$129 = \frac{P \times 5 \times \frac{15}{12} - P \times \frac{4 \times 8}{12}}{100}$

$12900 = \frac{75P - 32P}{12}$

$12900 = \frac{43P}{12}$

P = ₹ 3600

5. (4) Using Rule 1,
Let the sum lent in each case be x.
Then,

$\frac{x \times 9 \times 2}{100} + \frac{x \times 10 \times 2}{100} = 760$

$\frac{x \times 2}{100}(9 + 10) = 760$

$\Rightarrow \frac{2 \times 19x}{100} = 760$

$\Rightarrow x = \frac{760 \times 100}{2 \times 19} =$ ₹ 2000

6. (1) Let the rate of interest be r% and principal be P.
According to the question.

$\frac{16P}{25} = \frac{P \times r \times r}{100}$

[$\because$ r = t numerically]

$\Rightarrow r^2 = \frac{1600}{25}$

$\Rightarrow r = \frac{40}{5} = 8\%$

Aliter : Using Rule 5,

Here, $n = \frac{16}{25}$, R = T

Now $R \times R = \frac{16}{25} \times 100$

$R^2 = \frac{1600}{25}$

$R = \sqrt{\frac{1600}{25}}$

$R = \frac{40}{5}$

R = 8%

7. (3) Using Rule 1,
Let the sum lent out at 12.5% be x
$\therefore$ Sum lent out at 10%
$= 1500 - x$

Now, $\frac{(1500 - x) \times 10 \times 5}{100}$

$= \frac{x \times 12.5 \times 4}{100}$

$\Rightarrow 50(1500 - x) = 50x$

$\Rightarrow 2x = 1500$

$\Rightarrow x = \frac{1500}{2} = ₹\ 750$

8. (1) Let the principal be P and rate of interest be r %

According to the question,

$\frac{30P}{100} = \frac{P \times R \times 6}{100}$

$\Rightarrow 30 = 6R$

$\Rightarrow R = 5$

Now, let interest be equal to principal in T years.

$\therefore P = \frac{P \times 5 \times T}{100}$

$\Rightarrow T = \frac{100}{5} = 20$ years.

Aliter : Using Rule 5,

Here, $n = \frac{30}{100} = \frac{3}{10}$, T = 6 years.

$\Rightarrow RT = n \times 100$

$R \times 6 = \frac{3}{10} \times 100$

$R = 5\%$

As, S.I. = P

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

$100 = RT$

$100 = 5 \times T$

This is possible only when T = 20.

9. (3) Using Rule 1,

Let the period of time be T years.

Then,

$\frac{400 \times 5 \times T}{100} = \frac{500 \times 4 \times 6.25}{100}$

$\Rightarrow T = \frac{500 \times 4 \times 6.25}{400 \times 5} = \frac{25}{4}$

$= 6\frac{1}{4}$ years

10. (2) Let the annual rate of interest = r%

Time = r years

Let the principal be x.

$\therefore$ Interest = $\frac{x}{16}$

According to the question,

$\frac{x}{16} = \frac{x \times r \times r}{100}$ [$\because$ r = t]

$\Rightarrow 16r^2 = 100$

$\Rightarrow r^2 = \frac{100}{16} = \frac{25}{4}$

$\therefore r = \sqrt{\frac{25}{4}} = \frac{5}{2} = 2\frac{1}{2}\%$

Aliter : Using Rule 5,

Here, $n = \frac{1}{16}$, R = T

$RT = n \times 100$

$R^2 = \frac{100}{16}$

$R = \sqrt{\frac{100}{16}}$

$R = \frac{10}{4}$

$R = 2\frac{1}{2}\%$

11. (1) Using Rule 1,

Let the larger part of the sum be x

$\therefore$ Smaller part = ₹ $(12000 - x)$

According to the question,

$\frac{x \times 3 \times 12}{100} = \frac{(12000 - x) \times 9 \times 16}{2 \times 100}$

$\Rightarrow 36x = (12000 - x)\ 72$

$\Rightarrow x = (12000 - x) \times 2$

$\Rightarrow x + 2x = 24000$

$\Rightarrow 3x = 24000$

$\Rightarrow x = \frac{24000}{3} = ₹\ 8000$

12. (2) Let the principal be x and rate be y% per annum.

According to the question,

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

$\Rightarrow \frac{x}{4} = \frac{x \times y \times y}{100}$

$\Rightarrow y^2 = \frac{100}{4} = 25$

$\Rightarrow y = \sqrt{25} = 5\%$ per annum

Aliter : Using Rule 5,

$n = \frac{1}{5}$, R = T

$RT = n \times 100$

$R^2 = \frac{1}{4} \times 100$

$R^2 = 25$

$R = 5\%$

13. (3) Let the sum lent be x.

$\therefore \frac{x \times 7.5 \times 5}{100} - \frac{x \times 7.5 \times 4}{100} = 150$

$\Rightarrow \frac{x \times 7.5 \times 1}{100} = 150$

$\Rightarrow x = \frac{150 \times 100}{7.5} = ₹\ 2000$

Aliter : Using Rule 13,

Here, $P_1 = P$, $R_1 = 7.5\%$,

$T_1 = 4$ years.

$P_2 = P$, $R_2 = 7.5\%$, $T_2 = 5$ years.

S.I. = Rs. 150

S.I. $= \frac{P_2R_2T_2 - P_1R_1T_1}{100}$

$150 = \frac{P \times 7.5 \times 5 - P \times 7.5 \times 4}{100}$

$15000 = 7.5P$

$P = \frac{15000}{7.5}$

$P = \frac{150000}{75}$

$P = ₹\ 2000$

14. (1) Using Rule 1,

Let first part be x and second part be$(1750 - x)$

According to the question,

$x \times \frac{8}{100} = (1750 - x) \times \frac{6}{100}$

$\Rightarrow 8x + 6x = 1750 \times 6$

$\Rightarrow 14x = 1750 \times 6$

$\Rightarrow x = \frac{1750 \times 6}{14} = ₹\ 750$

$\therefore$ Interest = 8% of 750

$= 750 \times \frac{8}{100} = ₹\ 60$

15. (3) Using Rule 1,

Let the period of time be T years.

$\therefore 800 + \frac{800 \times 12 \times T}{100}$

$= 910 + \frac{910 \times 10 \times T}{100}$

$\Rightarrow 800 + 96T = 910 + 91T$

$\Rightarrow 96T - 91T = 910 - 800$

$\Rightarrow 5T = 110$

$\Rightarrow T = \frac{110}{5} = 22$ years.

16. (3) $\frac{\text{Simple interest}}{\text{Principal}} = \frac{1}{9}$

If the annual rate of interest be r%, then

$\text{Rate} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$\Rightarrow r = \frac{1}{9} \times \frac{100}{r}$

$\Rightarrow r^2 = \frac{100}{9}$

$\Rightarrow r = \sqrt{\frac{100}{9}} = \frac{10}{3} = 3\frac{1}{3}\%$

Aliter : Using Rule 5,

Here, $n = \frac{1}{9}$, R = T

$RT = n \times 100$

$R^2 = \frac{1}{9} \times 100$

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

$R = \sqrt{\frac{100}{9}}$

$R = \frac{10}{3}$

$R = 3\frac{1}{3}\%$

17. (2) 411, Using Rule 1,
Let 'r' be the rate of interest

$190 = \frac{500 \times 4 \times r}{100} + \frac{600 \times 3 \times r}{100}$

$\Rightarrow 20r + 18r = 190$

$\Rightarrow 38r = 190$

$\Rightarrow r = \frac{190}{38} = 5\%$

18. (2) $\frac{500 \times 2 \times R_1}{100} - \frac{500 \times 2 \times R_2}{100}$

= 2.5, where R_1 & R_2 are rate% of both banks

$\Rightarrow 10 (R_1 - R_2) = 2.5$

$\Rightarrow R_1 - R_2 = \frac{2.5}{10}$

= 0.25 % per annum

Aliter : Using Rule 7,
Here, P = Rs. 500, x = Rs. 2.50,
Difference in time = 2 years.
Difference in rate = ?

$500 = \frac{2.50 \times 100}{(\text{diff. in rate}) \times 2}$

Different in rate = 0.25%

19. (3) Using Rule 1,
Let the principal be x.

$\text{Time} = \frac{\text{SI} \times 100}{\text{Principal} \times \text{Rate}}$

$= \frac{x \times 100 \times 3}{x \times 50} = 6$ years

20. (2) Using Rule 1,

$\frac{P \times r \times 1}{100} = \frac{P \times 5 \times 2}{100}$

[$\because$ Capital is same in both cases]

$r \times 1 = 5 \times 2$

$\Rightarrow r = 10\%$

21. (1) Using Rule 1,

$\text{S.I.} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$\therefore \frac{4000 \times 3 \times x}{100}$

$= \frac{5000 \times 2 \times 12}{100}$

$\Rightarrow x = \frac{5 \times 2 \times 12}{4 \times 3}$

= 10% per annum

22. (4) Using Rule 1,

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

$\therefore y = \frac{x \times T \times R}{100}$

and $z = \frac{y \times T \times R}{100}$

So, $\frac{y}{z} = \frac{x}{y} \Rightarrow y^2 = zx$

23. (1) Using Rule 1,
Amount lent at 8% rate of interest = ₹ x

$\therefore$ Amount lent at $\frac{4}{3}\%$ rate of interest = ₹ $(20,000 - x)$

$\therefore \text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

$\therefore \frac{x \times 8 \times 1}{100} + \frac{(20,000 - x) \times \frac{4}{3} \times 1}{100}$

$= 800$

$\Rightarrow \frac{2x}{25} + \frac{20,000 - x}{75} = 800$

$\Rightarrow \frac{6x + 20,000 - x}{75} = 800$

$\Rightarrow 5x + 20,000 = 75 \times 800$

$= 60,000$

$\Rightarrow 5x = 60,000\text{-}20,000 = 40,000$

$\Rightarrow x = \frac{40,000}{5} =$ ₹ 8000

24. (3) Let amount invested in each company be Rs. x.

$\text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$

According to the question,

$\frac{x \times 15 \times 5}{100} - \frac{x \times 12 \times 4}{100}$

= 1350

$\Rightarrow \frac{75x}{100} - \frac{48x}{100} = 1350$

$\Rightarrow \frac{27x}{100} = 1350$

$\Rightarrow x = \frac{1350 \times 100}{27} =$ Rs. 5000

Aliter : Using Rule 13.
Here, P_1 = Rs. P, R_1 = 12%,
T_1 = 4 years
P_2 = Rs. P, R_2 = 15%,
T_2 = 5 years
S.I. = Rs. 1350

$\text{S.I.} = \frac{P_2 \times R_2 \times T_2 - P_1 \times R_1 \times T_1}{100}$

$1350 = \frac{P \times 15 \times 5 - P \times 12 \times 4}{100}$

135000 = 75 P – 48P
135000 = 75 P
$\Rightarrow$ P = Rs. 5000

25. (3) Using Rule 1,
True discount

$= \frac{\text{Amount} \times \text{Rate} \times \text{Time}}{100 + (\text{Rate} \times \text{Time})}$

$= \frac{2400 \times 5 \times 4}{100 + (5 \times 4)}$

$= \frac{2400 \times 5 \times 4}{120}$ = Rs. 400

S.I. = $\frac{2400 \times 5 \times 4}{100}$ = Rs. 480

Required difference
= Rs. (480 – 400) = Rs. 80

TYPE-V

1. (4) Using Rule 1,
Let the sum lent at the rate of interest 5% per annum is x and at the rate of interest 8% per annum is (1550 – x)
According to the question,

$$\frac{x \times 5 \times 3}{100} + \frac{(1550 - x) \times 8 \times 3}{100} = 300$$

$$\Rightarrow \frac{15x}{100} + \frac{37200 - 24x}{100} = 300$$

$\Rightarrow$ 15x + 37200 – 24x = 300 × 100
$\Rightarrow$ 9x = 7200
$\therefore$ x = ₹ 800 and,
1550 – x = 1550 – 800 = ₹ 750
$\therefore$ Ratio of money lent at 5% to that at 8% = 800 : 750 = 16 : 15

2. (2) Using Rule 1,
Let the sum of x be lent at the rate of 4% and (5000 – x) at the rate of 5%

$$\therefore \frac{x \times 4 \times 2}{100} + \frac{(5000 - x) \times 5 \times 2}{100} = 440$$

$\Rightarrow$ 8x + 50000 – 10x = 44000
$\Rightarrow$ 2x = 50000 – 44000 = 6000
$\Rightarrow$ x = ₹ 3000
$\therefore$ ₹ (5000 – x)
= ₹ (5000 – 3000) = ₹ 2000
Now, Required ratio
= 3000 : 2000 = 3 : 2

3. (4) Required ratio = $5 : \frac{2}{5} = 25 : 2$

$$\frac{\text{loan amount}}{\text{Interest amount}} = \frac{5}{2}$$

$$\Rightarrow \text{Interest rate} = \frac{2}{5}$$

$$\left[\because \frac{P+I}{I} = \frac{5}{2} \Rightarrow \frac{P}{I} + 1 = \frac{5}{2}\right.$$

$$\left.\Rightarrow \frac{P}{I} = \frac{3}{2}, \text{then } I = \frac{2}{5}\right]$$

$$\frac{\text{loan amount}}{\text{Interest rate}} = \frac{5}{2/5}$$

$= \frac{25}{2}$ or 25:2

4. (1) Using Rule 1,

$$P_1 : P_2 : P_3 = \frac{1}{r_1 t_1} : \frac{1}{r_2 t_2} : \frac{1}{r_3 t_3}$$

$$= \frac{1}{6 \times 10} : \frac{1}{10 \times 12} : \frac{1}{12 \times 15}$$

$$= \frac{1}{60} : \frac{1}{120} : \frac{1}{180}$$

= 6 : 3 : 2

5. (3) Using Rule 1,
Case-I,
Interest = $5x - 4x = x$

$$\therefore x = \frac{4x \times R \times T}{100}$$

$$\Rightarrow T = \frac{25}{R} \text{ years}$$

Case-II,

$$T = \frac{25}{R} + 3 = \left(\frac{25 + 3R}{R}\right) \text{years}$$

SI = 7 y – 5y = 2y

$$\therefore 2y = \frac{5y \times R \times (25 + 3R)}{R \times 100}$$

$\Rightarrow$ 40 = 25 + 3R
$\Rightarrow$ 3R = 40 –25 = 15 %

$$\Rightarrow R = \frac{15}{3} = 5\%$$

6. (4) Using Rule 1,

$$\frac{\text{Principal}}{\text{Amount}} = \frac{10}{12}$$

$$\frac{\text{Amount}}{\text{Principal}} = \frac{\text{Principal} + \text{interest}}{\text{Principal}}$$

$$= \frac{12}{10}$$

$$\Rightarrow 1 + \frac{\text{Interest}}{\text{Principal}} = \frac{12}{10}$$

$$\Rightarrow \frac{\text{Interest}}{\text{Principal}} = \frac{2}{10} = \frac{1}{5}$$

$$\therefore \text{Rate} = \frac{1}{5} \times 100 = 20\%$$

7. (2) Using Rule 1,

$$\text{Time} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Rate}}$$

$= \frac{3}{10} \times \frac{100}{10} = 3$ years

8. (1) Using Rule 1,
First part = Rs. x and second part = (12000 – x)

$$\therefore \frac{x \times 3 \times 12}{100}$$

$$= \frac{(12000 - x) \times 9 \times 16}{200}$$

$$\Rightarrow \frac{x}{12000 - x}$$

$$= \frac{9 \times 16 \times 100}{3 \times 12 \times 200} = \frac{2}{1} = 2 : 1$$

9. (1) Using Rule 1,
Principal : Interest = 25 : 1
$\Rightarrow$ Interest : Principal = 1 : 25

$$\therefore \text{Rate} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$$

$= \frac{1}{25} \times 100 = 4\%$ per annum

10. (2) Using Rule 1,

$$\frac{\text{Principal}}{\text{Interest}} = \frac{10}{3}$$

$$\Rightarrow \frac{\text{Interest}}{\text{Principal}} = \frac{3}{10}$$

$$\therefore \text{Rate} = \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$$

$= \frac{3}{10} \times \frac{100}{5} = 6\%$ per annum

11. (3) Principal lent at 8% S.I.
= Rs. x.
$\therefore$ Principal lent at 10% S.I.
= Rs. (4000 – x)

$$\text{S.I.} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$$

$$\therefore \frac{x \times 8}{100} + \frac{(4000 - x) \times 10}{100}$$

= 352
$\Rightarrow$ 8x + 40000 – 10x = 35200
$\Rightarrow$ 2x = 40000 – 35200 = 4800

$$\Rightarrow x = \frac{4800}{2} = \text{Rs. } 2400$$

TYPE-VI

1. (3) Using Rule 1,
Interest = ₹. (480–400) = ₹ 80

$\therefore\ 80 = \dfrac{400 \times r \times 4}{100} \Rightarrow r = 5$

Now, r = 7% (2% increase)

$\therefore$ S.I. $= \dfrac{400 \times 7 \times 4}{100} = 112$

$\therefore$ Amount = ₹ (400+112) = ₹ 512

2. (1) Using Rule 1,
Let his capital be x.
According to the question,

$\dfrac{x \times 11.5}{100} - \dfrac{x \times 10}{100} = 55.50$

or $(11.5 - 10)x = 5550$

or $1.5x = 5550$

or $x = \dfrac{5550}{1.5}$ = ₹ 3700

3. (1) Using Rule 1,
Change in SI

$= \left(\dfrac{25}{2} - 10\right)\% = \dfrac{5}{2}\%$

$\therefore \dfrac{5}{2}\%$ of principal = ₹ 1250

$\therefore$ Principal

$= ₹\ \dfrac{1250 \times 2 \times 100}{5} = ₹\ 50000$

4. (1) Let the sum = P and original rate = R% per annum.
Then,

$\dfrac{P \times (R+3) \times 2}{100} - \dfrac{P \times R \times 2}{100} = 72$

$\Rightarrow \dfrac{P \times 3 \times 2}{100} = 72$

$\Rightarrow$ P $= \dfrac{72 \times 100}{3 \times 2}$ = ₹ 1200

Aliter : Using Rule 13,
P_1 = P, R_1 = R, T_1 = 2
P_2 = P, R_2 = R + 3, T_2 = 2
S.I.= 72

$72 = \dfrac{P \times (R+3) \times 2 - P \times R \times 2}{100}$

7200 = 6P
P = ₹ 1200

5. (4) If the sum lent be Rs. x, then

$\dfrac{x \times 2.5 \times 3}{100} = 540$

$\Rightarrow x = \dfrac{540 \times 100}{2.5 \times 3}$ = ₹ 7200

Aliter : Using Rule 13,
P_1 = P, R_1 = R, T_1 = 3
P_2 = P, R_2 = R + 2.5% T_2 = 3
S.I. = Rs. 540

$540 = \dfrac{P \times (R + 2.5\%) \times 3 - P \times R \times 3}{100}$

54000 = 7.5P

P $= \dfrac{540000}{75}$

P = ₹ 7200

6. (1) $\dfrac{P \times 1 \times 2}{100} = 24$

$\Rightarrow$ P $= \dfrac{2400}{2}$ = ₹ 1200

Aliter : Using Rule 13,
P_1 = P, R_1 = R, T_1 = 2.
P_2 = P, R_2 = R + 1, T_2 = 2
S.I.= Rs. 24

$24 = \dfrac{P(R+1)2 - PR2}{100}$

2400 = 2PR + 2P – 2PR
P = ₹ 1200

7. (3) If the capital after tax deduction be x, then
$x \times (4 - 3.75)\ \% = 48$

$\Rightarrow \dfrac{x \times 0.25}{100} = 48$

$\Rightarrow \dfrac{x \times 25}{10000} = 48$

$\Rightarrow \dfrac{x}{400} = 48$

$\Rightarrow x = 48 \times 400$ = ₹ 19200

$\therefore$ Required capital

$= \dfrac{19200 \times 100}{96}$ = ₹ 20000

8. (1) If the principal be x, then

$\dfrac{x \times 3 \times 2}{100} = 300$

$\Rightarrow x = \dfrac{300 \times 100}{3 \times 2}$ = ₹ 5000

Aliter : Using Rule 13.
P_1 = P, R_1 = R, T_1 = 2.
P_2 = P, R_2 = R + 3, T_2 = 2.
S.I.= ₹ 300

$300 = \dfrac{P \times (R+3) \times 2 - PR2}{100}$

$300 = \dfrac{6P}{100}$

P = ₹ 5000

9. (4) Using Rule 1,
S.I. = 3264 – 2400 = ₹ 864

Rate $= \dfrac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \dfrac{864 \times 100}{2400 \times 4} = 9\%$ per annum

New rate = 10% per annum

$\therefore$ S.I. $= \dfrac{2400 \times 10 \times 4}{100} = ₹\ 960$

$\therefore$ Amount = 2400 + 960
= ₹ 3360

10. (4) Using Rule 1,
S.I. = ₹ (920 – 800) = ₹ 120

$\therefore$ Rate $= \dfrac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \dfrac{120 \times 100}{800 \times 3}$

= 5% per annum
New rate = 8% per annum

$\therefore$ S.I. $= \dfrac{800 \times 3 \times 8}{100}$ = ₹ 192

$\therefore$ Amount = (800 + 192) = ₹ 992

11. (1) Using Rule 1,
Case I,
S.I. = 920 – 800 = ₹ 120

Rate $= \dfrac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \dfrac{120 \times 100}{800 \times 3} = 5\%$ per annum

Case II,
Rate = 8% per annum

S.I. $= \dfrac{800 \times 8 \times 3}{100}$ = ₹ 192

$\therefore$ Amount = Principal + S.I.
= (800 + 192) = ₹ 992

12. (1) Using Rule 1,
S.I. = 2352 – 2100 = ₹ 252

Rate $= \dfrac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{252 \times 100}{2100 \times 2} = 6\%$ per annum

New rate = 5%

$\therefore$ S.I. $= \frac{252 \times 5}{6} =$ ₹ 210

13. (3) Using Rule 1,
S.I. = 956 – 800 = Rs. 156

$\therefore$ Rate $= \frac{\text{S.I.} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{156 \times 100}{800 \times 3} = 6.5\%$

New rate = (6.5 + 4)%
= 10.5%

$\therefore$ S.I. $= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \frac{800 \times 3 \times 10.5}{100} =$ Rs. 252

$\therefore$ Amount = Rs.(800 + 252)
= Rs.1052

14. (4) Using Rule 1,
Amount deposited in bank = Rs. x (let)

Difference of rates $= 5 - \frac{7}{2}$

$= \frac{3}{2}\%$ per annum

$\therefore$ S.I.

$= \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$\Rightarrow \frac{x \times 1 \times 3}{100 \times 2} = 105$

$\Rightarrow x = \frac{105 \times 200}{3} =$ Rs. 7000

TYPE-VII

1. (1) Using Rule 1,
Let x be lent at 8%, then (10000 – x) is lent at 10%.
Accordingly,

$\frac{10000 \times 9.2 \times t}{100} = \frac{x \times 8 \times t}{100} + \frac{(10000 - x) \times 10 \times t}{100}$

$\Rightarrow \frac{92000t}{100} = \frac{8xt}{100} + \frac{(10000 - x)10t}{100}$

$\Rightarrow$ 92000t = 8xt + (10000 – x) 10t

$\Rightarrow$ 92000 = 8x + 100000 – 10x

$\Rightarrow$ 2x = 8000

$\Rightarrow$ x = 4000

$\therefore$ First part = ₹ 4000

Second part = ₹. 6000

2. (1) Let x be lent on 8%.
$\therefore$ (1000 – x) is lent on 10%.
Interest = 9.2% of 1000 = ₹ 92

$\therefore 92 = \frac{x \times 8}{100} + \left(\frac{1000 - x}{100}\right) \times 10$

$\Rightarrow 8x + 10000 - 10x = 9200$

$\Rightarrow -2x = 9200 - 10000$

$\Rightarrow x = \frac{800}{2} =$ ₹ 400 = first part

$\therefore$ Second part = ₹ 600

3. (1) Interest
= (7000 + 630 × 8) – 12000
= (7000 + 5040) – 12000
= 12040 – 12000 = ₹ 40
Total Principal
= 5000 + 4370 + 3740 + 3110 + 2480 + 1850 + 1220 + 590
= ₹ 22360

$\text{Rate} = \frac{40 \times 100 \times 12}{22360 \times 1} \approx 2.1$ per cent

4. (4) Let the sum be ₹ 100.
For initial six months, Interest

$= 100 \times \frac{6}{100} \times \frac{6}{12} = 3\%$

Now, sum = 100 + 3 = ₹ 103
For another six months,
Interest

$= 103 \times \frac{6}{100} \times \frac{6}{12} = 3.09$

$\therefore$ Rate of interest per annum
= 3 + 3.09 = 6.09%

5. (3) Let the person have ₹ 100.
Then SI for 1 year

$= ₹ \left(\frac{40 \times 15 \times 1}{100} + \frac{30 \times 10 \times 1}{100} + \frac{30 \times 18 \times 1}{100}\right)$

= ₹ (6 + 3 + 5.4) = ₹ 14.4
$\therefore$ Rate of interest on whole sum
= 14.4%

6. (4) SI earned after two years

$= \frac{15600 \times 10 \times 2}{100} =$ ₹ 3120

$\therefore$ Principal for next two years
= ₹ (15600 + 3120)
= ₹ 18720
SI earned at the end of fourth year $= \frac{18720 \times 10 \times 1}{100} =$ ₹ 1872

7. (1) Let x be lent at 10% per annum.
$\therefore$ (1500 – x) is lent at 7% per annum.
Now,

$\frac{x \times 10 \times 3}{100} + \frac{(1500 - x) \times 7 \times 3}{100} = 396$

$\Rightarrow 30x + 31500 - 21x = 39600$

$\Rightarrow 9x = 39600 - 31500$

$\Rightarrow x = \frac{8100}{9} =$ ₹ 900

8. (2) Let each instalment be x.
Then,

$\left(x + \frac{x \times 4 \times 1}{100}\right) + \left(x + \frac{x \times 4 \times 2}{100}\right) + \left(x + \frac{x \times 4 \times 3}{100}\right) + x = 848$

$\Rightarrow \left(x + \frac{x}{25}\right) + \left(x + \frac{2x}{25}\right) + \left(x + \frac{3x}{25}\right) + x = 848$

$\Rightarrow \frac{26x}{25} + \frac{27x}{25} + \frac{28x}{25} + x = 848$

$\Rightarrow \frac{26x + 27x + 28x + 25x}{25} = 848$

$\Rightarrow 106x = 848 \times 25$

$\Rightarrow x = \frac{848 \times 25}{106} =$ ₹ 200

Aliter : Using Rule 10,
Here, A = ₹ 848,
T = 4 years, r = 4%
Equal instalment

$= \frac{848 \times 200}{4[200 + (4 - 1)4]}$

$= \frac{848 \times 200}{4 \times 212} =$ ₹ 200

9. (3) Using Rule 1.
Remaining amount
= ₹ (50000 – (8000 + 24000))
= ₹18000
Let ₹ 18000 be lent at the rate of r% p.a.
According to the question,

$$\frac{8000\times11\times1}{2\times100}+\frac{24000\times6\times1}{100}$$

$$+\ \frac{18000\times r\times1}{100}\ =3680$$

$\Rightarrow 440 + 1440 + 180r = 3680$

$\Rightarrow 1880 + 180r = 3680$

$\Rightarrow 180r = 3680 - 1880 = 1800$

$$\Rightarrow r=\frac{1800}{180}\ =10\%$$

10. (2) Using Rule 1.

Let the principal be x.

$$\therefore\ I_1=\frac{x\times10\times1}{2\times100}\ =\frac{x}{20}$$

$$I_2=\frac{x\times9\times1}{3\times100}\ =\frac{3x}{20}$$

$$I_3=\frac{x}{6}\times\frac{12\times1}{100}=\frac{x}{50}$$

$\therefore\ I_1 + I_2 + I_3$

$$=\left(\frac{x}{20}+\frac{3x}{100}+\frac{x}{50}\right)$$

$$=\left(\frac{5x+3x+2x}{100}\right)=\frac{x}{10}$$

$\therefore$ Average annual rate = 10%

11. (3) Using Rule 1.

If the principal be x, then

Simple interest = $(770 - x)$

$$\therefore\ \text{Principal}=\frac{\text{S.I.}\times100}{\text{Time}\times\text{Rate}}$$

$$\Rightarrow x=\frac{(770-x)\times100}{4\times10}$$

$\Rightarrow 2x = (770 - x) \times 5$

$\Rightarrow 2x + 5x = 770 \times 5$

$\Rightarrow 7x = 770 \times 5$

$$\therefore x=\frac{770\times5}{7}=₹\ 550$$

12. (4) Using Rule 1.

S.I. on ₹ 12000

$$=\frac{12000\times8\times1}{100}\ =₹\ 960$$

Desired gain on ₹ 20000

$$=20000\times\frac{10}{100}\ =₹\ 2000$$

$\therefore$ S.I. on ₹ 8000 = 2000 – 960

= ₹ 1040

$$\therefore\ \text{Rate}=\frac{\text{S.I.}\times100}{\text{Principal}\times\text{Time}}$$

$$=\frac{1040\times100}{8000}$$

= 13% per annum

13. (2) Using Rule 1.

S.I. after five years

$$=\frac{\text{Principal}\times\text{Time}\times\text{Rate}}{100}$$

$$=\frac{12000\times5\times10}{100}\ =₹\ 6000$$

Interest earned

= ₹— (6000 – 3320) = ₹ 2680

$$\therefore\ \text{Rate}=\frac{\text{S.I.}\times100}{\text{Principal}\times\text{Time}}$$

$$=\frac{2680\times100}{12000\times3}\ =\frac{67}{9}=7\frac{4}{9}\%$$

14. (4) Using Rule 1.

Case I

Let principal be x then Amount = $3x$

S.I. = $2x$

$$\therefore\ \text{Rate}=\frac{\text{S.I.}\times100}{\text{Principal}\times\text{Time}}$$

$$=\frac{2x\times100}{x\times8}=25\%$$

Case II

$$\text{Time}=\frac{\text{S.I.}\times100}{\text{Principle}\times\text{Rate}}$$

$$=\frac{3x\times100}{x\times25}=12\ \text{years}$$

15. (2) Using Rule 1.

Required percent

$$=\frac{1}{4}\times3+\frac{2}{3}\times5+\left(1-\frac{1}{4}-\frac{2}{3}\right)\times11$$

$$=\frac{3}{4}+\frac{10}{3}+\frac{11}{12}=\frac{9+40+11}{12}=5\%$$

16. (1) Using Rule 1.

$$120=\frac{300\times4\times r}{100}+\frac{400\times3\times r}{100}$$

$\Rightarrow 24r = 120$

$$\Rightarrow r=\frac{120}{24}=5\%\ \text{per annum}$$

17. (3) Using Rule 1.

If the sum of money be x, then

$$\frac{x\times6\times3}{100}+\frac{x\times5\times9}{100}+\frac{x\times3\times13}{100}$$

= 8160

$\Rightarrow 18x + 45x + 39x = 816000$

$\Rightarrow 102x = 816000$

$$\Rightarrow x=\frac{816000}{102}=₹\ 8000$$

18. (3) Using Rule 1.

If each amount lent be x, then

$$\frac{x\times7\times4}{100}\ +\ \frac{x\times5\times4}{100}\ =960$$

$$\Rightarrow\ \frac{48x}{100}\ =960$$

$$\Rightarrow x=\frac{960\times100}{48}\ =₹\ 2000$$

19. (3) Using Rule 1.

Let the money lent to Tom be Rs. x.

Simple interest

$$=\frac{\text{Principal}\ \times\ \text{Time}\ \times\ \text{Rate}}{100}$$

$$\therefore\ \frac{500\times8\times4}{100}+\frac{x\times8\times4}{100}$$

= 210

$$\Rightarrow\ 160+\frac{32x}{100}\ =210$$

$$\Rightarrow\ \frac{32x}{100}\ =210-160=50$$

$$\Rightarrow x=\frac{50\times100}{32}\ =\text{Rs. }156.25$$

20. (1) Using Rule 1.

$$\text{Rate}=\frac{20}{3}\%\ \text{per annum}$$

$\therefore$ S.I.

$$=\frac{\text{Principal}\times\text{Time}\times\text{Rate}}{100}$$

$$=\frac{2600\times20\times\text{T}}{3\times100}$$

$\therefore$ Required Time = 3 years

21. (1) Using Rule 1.

Principal = Rs. (60000 – 10000)

= Rs. 50000

$\therefore$ S.I. $= \dfrac{50000 \times 15 \times 2}{100}$

= Rs. 15000

22. (2) Using Rule 1.

Let the loans taken by A, B and C be Rs. x, Rs. y and Rs. z respectively.

$\therefore$ $x + y + z$ = Rs. 7930

S.I. $= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

According to the question,

$x + \dfrac{x \times 2 \times 5}{100} = y + \dfrac{y \times 3 \times 5}{100}$

$= z + \dfrac{z \times 4 \times 5}{100}$

$\Rightarrow \dfrac{100x + 10x}{100}$

$= \dfrac{100y + 15y}{100} = \dfrac{100z + 20z}{100}$

$\Rightarrow 110x = 115y = 120z$

$\Rightarrow 22x = 23y = 24z$

$\Rightarrow \dfrac{22x}{6072} = \dfrac{23y}{6072} = \dfrac{24z}{6072}$

[LCM of 22, 23 and 24 = 6072]

$\Rightarrow \dfrac{x}{276} = \dfrac{y}{264} = \dfrac{z}{253}$

$\therefore$ $x : y : z$ = 276 : 264 : 253

Sum of terms of ratio

= 276 + 264 + 253 = 793

$\therefore$ A's loan $= \dfrac{276}{793} \times 7930$

= Rs. 2760

23. (2) Using Rule 1.

Remaining amount

= Rs. (16000 – 4000)

= Rs. 12000

$\therefore$ S.I.

$= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \dfrac{12000 \times 15 \times 12}{12 \times 100}$ = Rs. 1800

$\therefore$ Total amount paid

= Rs. (16000 + 1800)

= Rs. 17800

24. (*) Using Rule 1.

S.I. after 1 year

$= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \dfrac{x \times 5}{100}$ = Rs. $\dfrac{x}{20}$

Principal for 2nd year

= Rs. $\left(2x + \dfrac{x}{20}\right)$ = Rs. $\dfrac{41x}{20}$

S.I. after second year

= Rs. $\left(\dfrac{41x}{20} \times \dfrac{5}{100}\right)$

= Rs. $\dfrac{41x}{400}$

Principal for third year

= Rs. $\left(3x + \dfrac{41x}{400}\right)$

= Rs. $\left(\dfrac{1200x + 41x}{400}\right)$

= Rs. $\dfrac{1241x}{400}$

$\therefore$ S.I. after 3rd year

= Rs. $\left(\dfrac{1241x}{400} \times \dfrac{5}{100}\right)$

= Rs. $\dfrac{1241x}{8000}$

$\therefore$ Required amount

= Rs. $\left(3x + \dfrac{1241x}{8000}\right)$

= Rs. $\left(\dfrac{24000x + 1241x}{8000}\right)$

= Rs. $\left(\dfrac{25241x}{8000}\right)$

25. (3) Using Rule 1.

S.I. $= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \dfrac{100000 \times 6 \times 6}{100}$ = Rs. 36000

Total pocket money

= 6 × 2500 = Rs. 15000

Total expenses of trust

= 6 × 500 = Rs. 3000

Total expenses

= Rs. (15000 + 3000)

= Rs. 18000

$\therefore$ Amount to be received by the boy

= Rs. (100000 + 36000 – 18000)

= Rs. 118000

26. (1) Let amounts be equal in T years.

S.I. $= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$\therefore$ P + $\dfrac{\text{P} \times x \times \text{T}}{100}$

$= \text{Q} + \dfrac{\text{Q} \times y \times \text{T}}{100}$

$\Rightarrow \dfrac{\text{P}\,x\,\text{T}}{100} - \dfrac{\text{Q}\,y\,\text{T}}{100} = \text{Q} - \text{P}$

$\Rightarrow \text{T}\left(\dfrac{\text{P}x - \text{Q}y}{100}\right) = \text{Q} - \text{P}$

$\Rightarrow \text{T} = 100\left(\dfrac{\text{Q} - \text{P}}{\text{P}x - \text{Q}y}\right)$

27. (4) Let the principal be Rs. 100

Interest = Rs. 10

Actual principal = Rs. 90

$\because$ Interest on Rs. 90 = Rs. 10

$\therefore$ Interest on Rs. 100

$= \dfrac{10}{90} \times 100$

$= \dfrac{100}{9} = 11\dfrac{1}{9}\%$

28. (2) Let the principal be Rs. P.

S.I. $= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \dfrac{\text{P} \times 5 \times 5}{100}$ = Rs. $\dfrac{\text{P}}{4}$

Amount = P + $\dfrac{\text{P}}{4}$ = Rs. $\dfrac{5\text{P}}{4}$

According to the question,

$\dfrac{5\text{P}}{4} \times \dfrac{2}{100} = 5$

$\Rightarrow \dfrac{\text{P}}{40} = 5$

$\Rightarrow$ P = 40 × 5

= Rs. 200

29. (1) Principal = Rs. 1950, Rate = 10% per annum

S. I. $= \dfrac{\text{Principal} \times \text{Time} \times \text{Rate}}{100}$

$= \dfrac{1950 \times 1 \times 10}{100}$ = Rs. 195

$\therefore$ Amount = Rs. (1950 + 195)

= Rs. 2145

TEST YOURSELF

1. A Co-operative Bank gives H.B. loans under the condition that if the loan be cleared with interest in five years, the rate of simple interest per year is 5%, otherwise it will be 7%. Mr. Rahim and Mr. Ram take the same amount of H.B. loan and clear the loan with interest in 5 and 8 years respectively. If Ram pays Rs. 62,000 more, what is the amount of loan taken by each of them ?

(1) Rs. 200000 (2) Rs. 180000
(3) Rs. 190000 (4) Rs. 210000

2. A person on retirement gets Rs. 3,20,000 from his gratuity and P.F. He wants to invest this amount in Post Office and Bank in such a way that he earns a total interest of Rs. 27,600 every year. If the annual rate of interest in Post Office and Bank be respectively 9% and 8%, What are the amounts invested in Post Office and Bank respectively ?

(1) Rs. 200000, Rs. 120000
(2) Rs. 180000 and Rs. 140000
(3) Rs. 185000, Rs. 135000
(4) None of these

3. Rahim lent a sum to Anil at a simple interest of 10% per annum, and at the same time lent to Sunil a sum, which was Rs. 2000 more than the amount lent to Anil at the simple interest of 12% per annum. At the end of 3 years, both Anil and Sunil returned the principal and interest to Rahim. If Rahim got Rs. 1020 more interest from Sunil than that from Anil, how much did each borrow from Rahim ?

(1) Rs. 2500, Rs. 4500
(2) Rs. 4000, Rs. 6000
(3) Rs. 5000, Rs. 7000
(4) Rs. 6000, Rs. 8000

4. A person made a fixed deposit of Rs. 30,000 in a bank for 5 years at 10% simple interest per annum. He had to withdraw the whole amount after 3 years to meet the expenses of his daughter's marriage and he received Rs. 7800 less than what he would have got after 5 years. What is the rate of simple interest per annum paid by the bank for this premature encashment ?

(1) 6% (2) 7%
(3) 8% (4) 9%

5. In 4 years, ₹ 6000 amounts to ₹ 8,000. In what time at the same rate will ₹ 525 amount to ₹ 700 ?

(1) 5 years (2) 3 years
(3) 4 years (4) None of these

6. Find the interest on ₹ 1460 at 10% from 5th February, 1992 to 25th April, 1992.

(1) ₹ 32 (2) ₹ 36
(3) ₹ 40 (4) ₹ 34

7. Find the amount Ram will get after 2 years when he invests ₹ 15000 at 15% interest.

(1) ₹ 18500 (2) ₹ 19500
(3) ₹ 17500 (4) ₹ 16500

8. At what rate per annum will a sum of ₹ 5000 amount to ₹ 6000 in 4 years?

(1) 6% Percent Per annum
(2) 4% Percent Per annum
(3) 5% Percent Per annum
(4) 4.5% Percent Per annum

9. Ram lent ₹ 1200 to Shyam for 5 years and ₹ 1500 to Mohan for 2 years received altogether ₹ 900 as interest. Find the rate per annum.

(1) 8.5% (2) 8%
(3) 9% (4) 10%

10. A certain sum of money amounts to Rs. 1680 in 3 years and to ₹ 1800 in 5 years. Find the sum and the rate of interest.

(1) ₹ 1500; 4% (2) ₹ 1200; 4%
(3) ₹ 1600; 5% (4) ₹ 1800; 5%

11. In how many years will a sum of money double itself at 5% rate of interest?

(1) 18 years (2) 20 years
(3) 22 years (4) 15 years

12. A man lends a certain sum of money and gets an interest equal to $\frac{1}{16}$th of the principal. The time for which money was lent is equal to the rate of interest. Find the rate of interest per annum.

(1) 4% (2) 3.5%
(3) 3% (4) 2.5%

13. A man borrowed ₹ 16000 from two persons. He paid 6% interest to one and 10% per annum to the other. In one year he paid total interest ₹1120. How much did he borrow at each rate?

(1) ₹ 10000 ; ₹ 6000
(2) ₹ 12000 ; ₹ 4000
(3) ₹ 11000 ; ₹ 5000
(4) ₹ 12500 ; ₹ 3500

14. A borrowed ₹ 1500 at 4% per annum and ₹1400 at 5% per annum for the same period. He paid ₹ 390 as total interest. Find the time for which he borrowed the sum.

(1) 3.5 years (2) 2.5 years
(3) 3 years (4) 4 years

15. Find the annual instalment that will discharge a debt of ₹12900 due in 4 years at 5% per annum simple interest.

(1) ₹ 2750 (2) ₹ 2150
(3) ₹ 2500 (4) ₹ 3000

16. A certain sum of money amounts to ₹ 6780 in 2 years and to ₹ 7360.50 in $3\frac{1}{2}$ years. Find the sum and the rate of interest.

(1) ₹ 6006 ; 6.4 Percent Per annum
(2) ₹ 8006 ; 6.4 Percent Per annum
(3) ₹ 5006 ; 5 Percent Per annum
(4) ₹ 5506 ; 5 Percent Per annum

17. If ₹ 5600 amounts to ₹ 6678 in $3\frac{1}{2}$ years, what will ₹ 9600 amount to in $5\frac{1}{4}$ years at the same rate of interest ?

(1) ₹ 12732 (2) ₹ 12372
(3) ₹ 12722 (4) ₹ 12237

18. A man promises to his wife a birthday present, given her each year a number of rupees equal to the number of years in her age. If her birthday falls on August 8, what sum must be placed at simple interest at 7% on January 1 before she is 63 (non leap year) in order to raise the required sum ?

(1) ₹ 1600 (2) ₹ 1550
(3) ₹ 1500 (4) ₹ 1450

19. It is decided that a loan of ₹ 10,000 will be paid off at the rate of ₹ 800 per month in 15 equal instalments. Find out the rate of return on investment.

(1) 17% P.a. (2) 18% P.a.
(3) 15% P.a. (4) 16% P.a.

20. A person takes loan of ₹ 4,000 on the condition that he would pay it in the monthly instalment of ₹ 500. He has to pay interest @ 6% on the outstanding balances, then find out the average rate of interest received by the creditor.

(1) $3\frac{3}{8}\%$ Percent Per annum

(2) $2\frac{3}{8}\%$ Percent Per annum

(3) $4\frac{3}{8}\%$ Percent Per annum

(4) $3\frac{1}{8}\%$ Percent Per annum

21. Divide ₹ 6800 into two parts so that S.I. on the first part for $3\frac{1}{3}$ years at 6% may be equal to the interest on the second part for $3\frac{1}{2}$ years at 4% Percent Per annum

(1) ₹ 2600 ; ₹ 4200
(2) ₹ 2800 ; ₹ 4000
(3) ₹ 2500 ; ₹ 4300
(4) ₹ 2700 ; ₹ 4100

SHORT ANSWERS

1. (1)	**2.** (1)	**3.** (3)	**4.** (3)
5. (3)	**6.** (1)	**7.** (2)	**8.** (3)
9. (4)	**10.** (1)	**11.** (2)	**12.** (4)
13. (2)	**14.** (3)	**15.** (4)	**16.** (1)
17. (2)	**18.** (3)	**19.** (4)	**20.** (1)
21. (2)			

EXPLANATIONS

1. (1) Let amount of loan per head be Rs. x.

$$\text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\therefore \frac{x \times 7 \times 8}{100} - \frac{x \times 5 \times 5}{100}$$

$$= 62000$$

$$\Rightarrow \frac{56x}{100} - \frac{25x}{100} = 62000$$

$$\Rightarrow 31x = 6200000$$

$$\Rightarrow x = \text{Rs. } 200000$$

2. (1) Let the amount in Post office be Rs. x.

$\therefore$ Amount in Bank

= Rs. $(320000 - x)$

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

$$\therefore \frac{x \times 9}{100} + \frac{(320000 - x) \times 8}{100}$$

$$= 27600$$

$$\Rightarrow 9x + 2560000 - 8x = 2760000$$

$$\Rightarrow x = 2760000 - 2560000$$

= Rs. 200000

$\therefore$ Amount in bank

= Rs. (320000 – 200000)

= Rs. 120000

3. (3) Sum given to Anil = Rs. x

Sum given to Sunil =Rs. $(x + 2000)$

$$\text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\Rightarrow \frac{(x + 2000) \times 12 \times 3}{100} - \frac{x \times 10 \times 3}{100}$$

$$= 1020$$

$$\Rightarrow 36x + 72000 - 30x = 102000$$

$$\Rightarrow 6x = 102000 - 72000 = 30000$$

$$\Rightarrow x = \text{Rs. } 5000$$

$\therefore$ Sum given to Sunil

= Rs. 7000

4. (3) $\text{S.I.} = \frac{\text{P} \times \text{R} \times \text{T}}{100}$

Let the required rate of interest be R% per annum.

$$\therefore \frac{30000 \times 5 \times 10}{100} - \frac{30000 \times 3 \times \text{R}}{100}$$

$$= 7800$$

$$\Rightarrow 15000 - 900\text{R} = 7800$$

$$\Rightarrow 900\text{R} = 15000 - 7800 = 7200$$

$$\Rightarrow \text{R} = \frac{7200}{900} = 8\% \text{ per annum.}$$

5. (3) Case-I,

Interest = 8000 – 6000

= Rs. 2000

$$\text{Rate} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$$

$$= \frac{2000 \times 100}{6000 \times 4} = \frac{25}{3}\%$$

$\therefore$ Case-II,

$$\text{Time} = \frac{175 \times 100}{525 \times \frac{25}{3}} = 4 \text{ years}$$

6. (1) P = ₹ 1460

R = 10%

1992 is a leap year

$\therefore$ T = (24 + 31 + 25) days = 80 days.

$$I = \frac{PRD}{36500}$$

$$I = \frac{1460 \times 10 \times 80}{36500}$$

I = ₹ 32.

Note : We have excluded 5th February but included 25th

7. (2) Here, P = ₹ 15000

R = 15%

T = 2 years

$$A = P\left(\frac{100 + RT}{100}\right)$$

$$= 15000\left(\frac{100 + 15 \times 2}{100}\right)$$

$$= 15000 \times \frac{130}{100}$$

A = ₹19500.

8. (3) Here, P = ₹ 5000
A = ₹ 6000
T = 4 years
So, $I = A - P$
= ₹ (6000 – 5000) = ₹ 1000

$$R = \frac{100I}{PT}$$

$$R = \frac{100 \times 1000}{5000 \times 4}$$

R = 5%.

9. (4) $I = I_1 + I_2$

$$I = \frac{P_1RT_1}{100} + \frac{P_1RT_2}{100}$$

$$I = \frac{R}{100}(P_1T_1 + P_2T_2)$$

or, $\boxed{R = \frac{100\ I}{P_1T_1 + P_2T_2}}$

Here, I = ₹ 900
P_1 = ₹ 1200
T_1 = 5 years
P_2 = ₹ 1500
T_2 = 2 years

$$R = \frac{100 \times 900}{(1200 \times 5) + (1500 \times 2)}$$

$$R = \frac{90{,}000}{9{,}000}$$

R = 10%.

Note : In case of more than two investment, sum the products of principal and time of each case.

10. (1) $A = P + I$
So, P remains same in both cases. Only amount of interest is different in two cases because the time period are different.
P + Interest for 5 years = ₹ 1800
and P + Interest for 3 years
= ₹ 1680
On subtraction we get,
Interest for 2 years = ₹ 120
Now, we solve for the case of 3 years.
Interest for 3 years

$$= ₹120 \times \frac{3}{2} = ₹\ 180$$

And amount after 3 years
= ₹1680
Principal (P) = $A - I$
= ₹ (1680 – 180) = ₹ 1500.

$$R = \frac{100\ I}{PT}$$

$$\Rightarrow R = \frac{100 \times 180}{1500 \times 3} \Rightarrow R = 4\%.$$

Note : Alternatively, we could have solved for 5 years too and got the same answer.

11. (2) A sum doubles itself when amount of interest becomes equal to the principal.
So, $I = P$
Given, R = 5%

$$T = \frac{100\ I}{PR}$$

On substitution we get,

$$T = \frac{100 \times P}{P \times 5}$$

T = 20 years.

12. (4) $I = \frac{PRT}{100}$

Given : $I = \frac{P}{16}$

and $T = R$
So, on substitution we get

$$\frac{P}{16} = \frac{P \times R \times R}{100}$$

$$\Rightarrow R^2 = \frac{100}{16}$$

$$\Rightarrow R = \frac{10}{4}\% = \frac{5}{2}\% = 2\frac{1}{2}\%.$$

13. (2) Let the sum borrowed at 6% be ₹ $x = P_1$
Then the sum borrowed at 10% = ₹ (16000 – x) = P_2
Time is one year in both cases
R_1 = 6%
R_2 = 10%
$I = I_1 + I_2$

$$I = \frac{P_1R_1T}{100} + \frac{P_2R_2T}{100}$$

$$I = \frac{T}{100}(P_1R_1 + P_2R_2)$$

or $P_1R_1 + P_2R_2 = \frac{100\ I}{T}$

On substitution we get,
$(x \times 6) + (16000 - x)10$

$$= \frac{100 \times 1120}{1}$$

$\Rightarrow$ 160000 – 4x =112000
$\Rightarrow$ 4x = 48000
$\Rightarrow$ x = ₹ 12000
and 16000 – x = ₹ 4000.

14. (3) $I = I_1 + I_2$

$$I = \frac{P_1R_1T}{100} + \frac{P_2R_2T}{100}$$

or $T = \frac{100\ I}{P_1R_1 + P_2R_2}$

$$= \frac{100 \times 390}{(1500 \times 4) + (1400 \times 5)}$$

$$= \frac{39000}{13000}$$

T = 3 years.

15. (4) Let each equal annual instalment be x.
First instalment is paid after 1 year and hence will remain with the lender for the remaining (4 – 1) = 3 years.
Similarly, second instalment will remain with the lender for 2 years, third instalment for 1 year and the final fourth instalment remain x as such.
$A = A_1 + A_2 + A_3 + A_4$

$$A = P\left(\frac{100 + RT}{100}\right)$$

$\Rightarrow A$

$$= x\left[\frac{100 + 5 \times 3}{100} + \frac{100 + 5 \times 2}{100} + \frac{100 + 5 \times 1}{100} + \frac{100 + 5 \times 0}{100}\right]$$

$\Rightarrow$ 12900

$= x\left[\frac{115+110+105+100}{100}\right]$

$\Rightarrow 12900 = \frac{430}{100}x$

$\Rightarrow x = \frac{12900 \times 100}{430}$

$\Rightarrow x =$ ₹ 3000

16. (1) Principal + S.I. for $3\frac{1}{2}$ years

= ₹ 7360.50 ..... (i)

Principal + S.I. for 2 years

= ₹ 6780 ..... (ii)

On subtracting equation (ii) from (i),

S.I. for $1\frac{1}{2}$ years = ₹ 580.50

∴ S.I. for 2 years

$= ₹ \left(\frac{580.50 \times 2 \times 2}{3}\right) = ₹ 774$

∴ Principal = ₹ (6780 – 774)

= ₹ 6006

And, rate of interest

$= \frac{774 \times 100}{6006 \times 2} = 6.4\%$ per annum.

17. (2) Interest = ₹ (6678 – 5600)

= ₹ 1078

$\text{Rate} = \frac{\text{Interest} \times 100}{\text{Principal} \times \text{Time}}$

$= \frac{1078 \times 100 \times 2}{5600 \times 7}$

$= 5\frac{1}{2}\%$ per annum

∴ S.I. on ₹ 9600 for $5\frac{1}{4}$ years

$= ₹ \left(\frac{9600}{100} \times \frac{21}{4} \times \frac{11}{2}\right) = ₹ 2772$

∴ Amount = ₹ (9600 + 2772)

= ₹ 12372

18. (3) Let the sum be ₹ 100.

Number of days from January 1 to August 8 = 31 + 28 + 31 + 30 + 31 + 30 + 31 + 7 = 219 days

$= \frac{219}{365}$ year $= \frac{3}{5}$ year

S.I. on ₹ 100 for $\frac{3}{5}$ year at 7%

$= ₹ \left(\frac{100 \times 3 \times 7}{100 \times 5}\right) = ₹ \frac{21}{5}$

If required money is ₹ $\frac{21}{5}$, sum

= ₹ 100

If required money is Rs. 63, sum

$= ₹ \left(100 \times \frac{5}{21} \times 63\right)$

= ₹ 1500

19. (4) Number of monthly instalments = 15

Monthly instalment = ₹ 800

Time (T) = $\frac{15}{12} = 1\frac{1}{4}$

∴ Total amount paid

= ₹ (800 × 15) = ₹ 12,000

Interest = ₹ (12,000 – 10,000)

= ₹ 2,000

When

Investment	Interest	Years
10,000 ↑	2000 ↑	$1\frac{1}{4}$ ↓
100	?	1

∴ Rate of return

$= \frac{100 \times 2{,}000 \times 1 \times 4}{10{,}000 \times 5} = 16\%$

20. (1) Monthly instalment = ₹ 500

Total loan = ₹ 4000

∴ Number of instalments

$= \frac{4{,}000}{500} = 8$

Once the payment starts, outstanding balances will go on diminishing.

Hence, from point of view of interest, principal = 4000 + 3500 + 3000 + 2,500 + 2000 + 1500 + 1,000 + 500 = ₹ 18,000

∴ Interest on ₹ 18,000 for 1 month at 6% P.a.

$= \frac{18000 \times 6 \times 1}{100 \times 12}$ = ₹ 90

Average rate of interest

$= \frac{I \times 100}{P \times T}$

$\boxed{T = 8\,\text{months} = \frac{8}{12}}$ year

$= \frac{90 \times 100 \times 12}{4000 \times 8}$

$= \frac{27}{8}\% = 3\frac{3}{8}\%$

21. (2) Let the first part be x. Then second part = (6800 – x)

Interest on first part for $3\frac{1}{3}$ years at 6%

$= \frac{x \times 6 \times \frac{10}{3}}{100} = \frac{x}{5}$

Interest on second part for $3\frac{1}{2}$ years at 4%

$= \frac{(6800 - x) \times 4 \times \frac{7}{2}}{100}$

$= ₹ \frac{(6800 - x)\,7}{50}$

According to the problem,

$\frac{x}{5} = \frac{(6800 - x)\,7}{50}$

$\Rightarrow 10x = (6800 - x)\,7$

$\Rightarrow 10x = 47600 - 7x$

$\Rightarrow 17x = 47600$

$\Rightarrow x = 2800$

Hence, first part = ₹ 2800

and second part

= ₹ (6800 – 2800) = ₹ 4000.