SIMPLE INTEREST

SYNOPSIS - 1

1. Some times we need to borrow money from a friend or a bank or a moneylender. We promise to return it after a specified period of time. At the end of this period we have to pay the money borrowed and some additional money for using the lender's money. This we define the following terms.
2. **Principal :** The money borrowed is called the principal or sum (P).
3. **Interest :** The additional money paid by the borrower to the lender (S.I) for having used his/her money is called the interest.
4. **Amount :** The total money paid back by the borrower to the lender (1) is called amount.
   The Amount = Principal + Interest
5. **Rate :** Interest on Rs 100 for 1 year is called the rate % per annum (R).
6. If interest is calculated uniformly on the original principal throughout the loan period then it is called simple interest.
7. **Formula for calculating simple interest (S.I) :**

   $$S.I. = \frac{PTR}{100}$$

   where P = Principal, R = Rate % per annum, T = Time years

   $$\text{Amount} = P + S.I = P + \frac{PTR}{100} = P\left(1+\frac{TR}{100}\right)$$

8. Calculate S.I. on a sum of Rs.5000 at 4% in 3 years. P = 5000/-, R = 4%, T = 3 years. Calculate the amount.

   $$\text{Also } S.I. = \frac{PTR}{100} = \frac{5000\times 3\times 4}{100} = 600/-$$

   Amount = Principal + Interest = 5000/- + 600/- = 5600/-
9. **Additional formulae :**

   a) $\frac{P\times T\times R}{100} = S.I$ 2) $P = \frac{S.I\times 100}{TR}$

   c) $T = \frac{S.I\times 100}{PR}$ 4) $R = \frac{S.I\times 100}{PT}$

Solved Examples :

1. **Calculate the principal if S.I on a certain sum at 10% in 2 years is Rs 200/-**

Sol. S.I. = 200/-, T = 2 years, R = 10%, P = ?

$$P = \frac{S.I\times 100}{T\times R} = \frac{100\times 200}{10\times 2} = 1000/-$$

2. **Calculate amount on a sum of Rs 2000/- at 5% in 4 years.**

Sol. $A = P\left(1+\frac{TR}{100}\right) = 2000\left(1+\frac{5\times 4}{100}\right) = 2000\left(1+\frac{20}{100}\right) = \frac{2000\times 120}{100} = 2400/-$

3. A certain sum doubles itself in 20 years. Find the rate

Sol. Let principal be 100/-.
Amount will be double the principal = 200/-
A = 200/-, P = 100/-
S.I. = A – P = 200 – 100 = 100/-
T = 20 years, Rate = ?

$$R = \frac{100 \times S.I}{P \times T} = \frac{100 \times 100}{100 \times 20} = 5\%$$

4. In what time will 800/- triple, if sum at 10% of PA.

Sol. P = 800/-
Amount = 3 × 800 = Rs.2400; S.I = 2400 – 800 = Rs.1600

R = 10%, T = ?; $T = \frac{100 \times S.I}{P \times R} = \frac{100 \times 1600}{800 \times 10} = 20$ years

5. Calculate the S.I. If a sum of Rs.2000 is deposited in a bank paying 10% PA. Interest from 1-07-2001 to 11-09-2001.

Sol. P = 2000/- ; R = 10%
T = 1-07-2001 to 11-09-2001 = 73 days

$$S.I. = \frac{PTR}{100} = \frac{2000 \times 10}{100} \times \frac{73}{365} = 40/-$$

WORK SHEET - 1

SINGLE ANSWER TYPE

1. If a sum of Rs.4800 is deposited in a bank for 4 years paying S.I. of $6\frac{1}{4}\%$ PA, then simple interest is
   1) 1300/- 2) 1800/- 3) 1200/- 4) 1600/-
2. Simple interest on a sum of Rs 73000 at the rate of 24% per annum from 12-02-1991 to 30 - 09 - 91 is
   1) 11040/- 2) 11030/- 3) 11020/- 4) 11060/-
3. A person borrowed an amount of Rs.15000 from a bank at the rate of 20% per annum. He lends Rs. 10000 to a friend at 25% PA and Rs.5000 to another friend at 30% PA. If he repays the amount to the bank after 3 years the amount of profit he gets is
   1) 3200/- 2) 3500/- 3) 3000/- 4) 3600/-
4. A person deposited 20000/- in a finance company in term deposit. Which gives an interest of 10% PA, interest is calculated every 6 months and added to the principal. If interest on next 6 months is calculated on the total amount. The amount received by him after one year is
   1) 22050/- 2) 22060/- 3) 22075/- 4) 22040/-
5. Simple interest is calculated at the rate 4 paise per rupee per month. If a sum of 8000/- is deposited for 3 years, then the simple interest is
   1) 950/- 2) 940/- 3) 960/- 4) 980/-
6. Ramesh borrowed a certain sum at 10% PA in 2 years. If he repaid 6000/- at the end of 2 years then the sum is
   1) 5500/- 2) 5200/- 3) 5600/- 4) 5000/-

7. In what time will 8000/- amount to 11840/- at 8% of PA is
   1) 6 years 2) 8 years 3) 4 years 4) 9 years
8. If S.I. on 3650/- in 3 years is 1314/- then the rate of interest is
   1) 10% 2) 14% 3) 12% 4) 16%
9. If a certain sum becomes 4 times it self in 16 years, then the rate of interest is
   1) $18\frac{1}{4}\%$ PA 2) $18\frac{1}{2}\%$ PA 3) $18\frac{3}{4}\%$ PA 4) $18\frac{2}{3}\%$ PA
10. If A certain sum becomes 5 times itself at 25% of PA, then the time is
    1) 10 years 2) 18 years 3) 16 years 4) 12 years

WORK SHEET - 2

SINGLE ANSWER TYPE

1. Interest that is calculated uniformly on the original principal through out the loan period is :
   1) Simple Interest 2) Compound Interest
   3) Amount 4) Principal
2. The time given by the lender to the borrower to repay the total amount is
   1) Time period 2) Rate 3) Principal 4) Amount
3. The amount of money one borrows for his needs is
   1) Principal 2) Sum 3) Amount 4) both 1 & 2
4. The extra money repaid to the lender an addition of the principal is
   1) Principal amount 2) Amount
   3) Interest 4) Principal
5. Total money paid by the borrower to the lender is
   1) Rate 2) Interest 3)0 Amount 4) Principal
6. Interest on Rs. 100 for 1 yea is
   1) Rate of interest per annum 2) Time period
   3) Time of interest 4) Principal
7. The simple interest on Rs. 1820 from March 9, 2003 to May 21, 2003 at $7\frac{1}{2}\%$ rate will be :
   1) Rs.22.50 2) Rs. 27.30 3)Rs.28.80 4) Rs. 29
8. The simple interest at x% for x years will be Rs. x on a sum of :
   1) Rs. x 2) Rs. $\left(\frac{100}{x}\right)$ 3) Rs. 100x 4) Rs. $\left(\frac{100}{x^2}\right)$
9. 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 Rs.800 become in 3 years ?
   1) Rs. 1020.80 2) Rs. 1025 3) Rs. 1052 4)Data Inadequate
10. What will be the ratio of simple interest earned by certain amount at the same rate of interest for 6 years and that for 9 years?
    1)1 : 3 2) 1 : 4 3) 2 : 3 4) Data inadequate
11. A man borrow Rs. 4000 and pays back after 5 years at 15% simple interest. The amount paid by the man is:
    1) Rs.1800 2) Rs.4800 3) Rs.7500 4) Rs.7000

12. What is the rate of simple interest at which Rs.14,000 gives interest of Rs. 1960 in two years ?
    1) 4% 2) 5% 3) 7% 4) 10%
13. If the rate of simple interest is 12% per annum, the amount that would fetch interest of Rs.6000 per annum is:
    1) Rs.7200 2) Rs.48000 3) Rs.50000 4) Rs.72000
14. A sum was put at simple interest at a certain rate for 2 years. Had it been put at 4% higher rate, it would have fetched Rs.112 more. The sum is:
    1) 1120 2) 1400 3) 1200 4) 8000
15. A sum of money doubles itself in 12 years. In how many years would it tripled itself ?
    1) 36years 2) 18years 3) 24years 4) 15years
16. What will be the compound interest on a sum of 25,000 after 3 years at the rate of 12per compound per annum?
    1) Rs.9000.30 2) Rs.9720 3) Rs.10483.20 4) Rs.10123.20
17. What is the difference between the compound interests on Rs.5000 for $1\frac{1}{2}$ years at 4% per annum compounded yearly and half-yearly?
    1) Rs.2.04 2) Rs.3.06 3) Rs.4.80 4) Rs.8.30
18. Find the compound interest on Rs.15,625 for 9 months at 16% per annum compounded quarterly.
    1) Rs.1851 2) Rs. 1941 3) Rs. 1951 4) Rs. 1961
19. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347 The period (in years) is:
    1) 2 2) $2\frac{1}{2}$ 3) 3 4) 4
20. The CI on Rs. 5000 for 3 years at 8% for first year, 10% for second year and 12% for third year will be:
    1) Rs.1750 2) Rs.1652.80 3) Rs.1575 4) Rs.1685.20
21. The difference between CI and SI on a sum of money lent for 2 years at 10% is Rs.40. The sum is:
    1) 1600 2) 2000 3) 4000 4) 3500
22. The difference between simple and compound interest on Rs. 6000 for 1 year at 20% per annum reckoned half yearly is:
    1) 120 2) 60 3) 180 4) 72

MULTI ANSWER TYPE

23. C.I and S.I for a certain sum at certain rate of interest are 220 Rs and 200 Rs. at the end of the second year which of the following is true
    1) Rs. P = 500 2) Rs. P = 1000 3) R = 20% p.a 4) R=10% p.a.
24. A sum of Rs 1600 gives a simple interest of Rs 252 in 2years and 4 months rate of interest ?
    1) $6\frac{1}{2}\%$ pa. 2) $\frac{27}{16}\%$ p.q. 3) $6\frac{3}{4}\%$ p.a. 4) $\frac{27}{88}\%$ p.h.

25. If the simple interest on a sum of money for 2years at 5% per annum is Rs. 50. What is the compound interest on the same sum at the same rate and for the same time.

1) Rs. 57.25 2) Rs. $\frac{5125}{100}$ 3) Rs. $\frac{512.5}{10}$ 4) Rs. $\frac{6406.25}{125}$

REASONING ANSWER TYPE

26. *Statement I:* The S.I. on Rs. 1820 from march 9,2003 to may 21,2003 at $7\frac{1}{2}\%$ rate p.a. will be Rs. 27.30.
Statement II: The S.I. on Rs. 10 for 4 months at the rate of 3 paise per one rupee per month is Rs 1.60.
1) Both Statement-I and Statement-II are true.
2) Both Statement-I and Statement-II are false.
3) Statement I is true, Statement II is false.
4) Statement I is false, Statement II is true.

27. *Statement I:* Compound interest on Rs 16,000 at 20% per annum for 9 months, compounded Quarterly is Rs. 2524.
Statement II: A sum of money to Rs 6690 after 3years and to Rs 10, 035 after 6years on C.I. then the sum is Rs. 4460.
1) Both Statement-I and Statement-II are true.
2) Both Statement-I and Statement-II are false.
3) Statement I is true, Statement II is false.
4) Statement I is false, Statement II is true.

28. *Statement I:* Annual instalment will discharge a debt of Rs 1092 due in 3year at 12% S.I on buying a radio then the actual cost for which the customer has bought is Rs. 975.
Statement II: A certain sum of money amounts to Rs. 1008 in 2years and to Rs. 1164 in $3\frac{1}{2}$ years then rate of interest is 13% on S.I.
1) Both Statement-I and Statement-II are true.
2) Both Statement-I and Statement-II are false.
3) Statement I is true, Statement II is false.
4) Statement I is false, Statement II is true.

29. *Statement I:* The rate of C.I per annum will a sum of Rs 1200 become Rs. 1348.32 in 2years is 6%.
Statement II: A sum of money invested at compound interest amounts to Rs. 800 in 3years and to Rs 840 in 4years. The rate of interest per annum is 5%.
1) Both Statement-I and Statement-II are true.
2) Both Statement-I and Statement-II are false.
3) Statement I is true, Statement II is false.
4) Statement I is false, Statement II is true.

COMPREHENSION TYPE

Writeup:1

If Rs 6,400 is invested at a compound interest rate of $6\frac{1}{4}\%$ per annum then find

30. The amount after one year is
    1) Rs. 6,600 2) Rs. 6,800 3) Rs. 7,600 4) Rs. 7,800
31. The amount after two years is
    1) Rs. 7,225 2) Rs. 7,325 3) Rs. 7,250 4) Rs. 7,350
32. The interest earned in 2nd year is
    1) Rs. 820 2) Rs. 825 3) Rs. 425 4) Rs. 400

Writeup:2

A man invests Rs 5,000 for three years at a certain rate of interest, compound annual. At the end of first year it amounts to Rs 5,600 calculate.

33. The rate of the interest per annum ?
    1) 11% 2) 12% 3) 13% 4) 14%
34. The interest occurred in the 2nd year ?
    1) Rs. 672 2) Rs 682 3) Rs. 772 4) Rs. 782
35. The amount at the end of the 3rd year ?
    1) Rs. 7,024 2) Rs. 7,024.60 3) Rs. 7,024.64 4) Rs. 7,024.84

Writeup:3

A sum of Rs 30,000 is given for interest for 3 years at $7\frac{1}{2}\%$ p.a. at the compound interest.

36. What is the sum at the end of the 2nd year ?
    1) Rs. 34, 658 2) Rs. 34, 668 3) Rs. 34, 658.75 4) Rs. 34, 668.75
37. What is the sum at the end of the 3years ?
    1) Rs. 37, 268.90 2) Rs. 37, 268 3) Rs. 37, 368.92 4) Rs. 37,268.80
38. What is the total interest earned in 3years?
    1) Rs. 7, 268.90 2) Rs. 7, 368.90 3) Rs. 7, 368 4) Rs. 7, 268.80

MATRIX MATCH TYPE:

39. **A man invests Rs 46,875 at 4% per annum compound interest for 3years.**

Column-I	Column-II
1) The interest for the 1st year is	1) Rs. 2,028
2) The amount standing to his credit at the end of the 2nd year is	2) Rs. 52,728
3) The interest for the 3rd year is	3) Rs. 1,875
4) The amount that the man will receive after 3 years is	4) Rs. 50,700

40. **A man takes a loan of Rs 10,000 at a compound interest rate of 10% per annum**

Column-I	Column-II
1) The amount after one year	1) Rs. 12,100
2) The compound interest for 2 years	2) Rs. 11,000
3) Sum of money required to clear the debt at the end of the 2 years	3) Rs. 2,100
4) The difference between the C.I and S.I at the same rate for 3 years	4) Rs. 310

41. **A sum of Rs 60,000 is invested in a bank for $\frac{1}{2}$ years at the rate of 8% per annum. If the interest is compounded in the account half yearly. Find the following**

Column-I	Column-II
1) The balance at first half year	1) Rs. 67, 491.84
2) The balance after one year	2) Rs. 7, 491.84
3) Amount will be received earned in $1\frac{1}{2}$ years	3) Rs. 62, 400
4) The total interest earned in $1\frac{1}{2}$ years	4) Rs. 64, 896

42. The S.I. on 60,000 Rs. at 2 Rs. per Rs. 100 per month for 14 months is _____

KEY & HINTS

WORK SHEET – 1 (KEY)				
1) 3	2) 1	3) 3	4) 1	5) 3
6) 4	7) 1	8) 3	9) 3	10) 3

1. $S.I = \frac{PTR}{100} = 4800 \times 6\frac{1}{4} \times \frac{4}{100} = 4800 \times \frac{25}{4} \times \frac{4}{100} = 1200/-$

2. Time = T = 16 days in Feb + 31 days in March + 30 days in April + 31 days in May + 30 in June + 31 in July + 31 in August + 30 in September = 230 days

   R = 24%, P = 73000/-, $T = \frac{230}{365}$ years

   $S.I. = \frac{PTR}{100} = \frac{73000 \times 24}{100} \times \frac{230}{365}$ = 240 × 46 = 11040/-

3. Interest to be paid to the bank after 3 years = $\frac{15000 \times 3 \times 20}{100}$ = 9000/-

   Amount to be paid to the bank after 3 years = 15000 + 9000 = 24000/-

   Amount received from first friend = $\frac{10000 \times 3 \times 25}{100} + 10000$ = 17500/-

   Amount received from 2nd friend = $\frac{5000 \times 3 \times 30}{100} + 5000$ = 9500/-

   Amount received from both the friends = 17500 + 9500 = 27000

   Amount to be paid to the bank = 24000

   ∴ gain = 27000 – 24000 = 3000/-

4. Interest for 6 months = $\frac{20000}{100} \times 10 \times \frac{6}{12}$ = 1000/-

Amount at the end of 6 months = 20000 + 1000 = 21000/-

Interest for next 6 months = $\frac{21000}{100} \times 10 \times \frac{6}{12}$ = 1050/-

Amount at the end of one year = 1050 + 21000 = 22050/-

5. S.I. = $\frac{8000 \times 4 \times 3}{100} = 960/-$

6. Let principal be P.

$$P + \frac{PTR}{100} = 6000$$

$$\Rightarrow P + \frac{P \times 10 \times 2}{100} = 6000$$

$$\Rightarrow P + \frac{P}{5} = 6000$$

$$\Rightarrow \frac{6P}{5} = 6000$$

$$\Rightarrow P = 6000 \times \frac{5}{6} = 5000/-$$

7. Amount = 11840/- and Principal = 8000/-
Simple Interest = 11840 – 8000 = 3840/-
Rate = 8%, T = ?

$$\therefore T = \frac{100 \times S.I}{P \times R} = \frac{3840 \times 100}{8000 \times 8} = 6 \text{ years.}$$

8. $R = \frac{100 \times S.I}{P \times T} = \frac{1314 \times 100}{3650 \times 3} = 12\%$

9. Let principal be 100/- and Amount will be 400/-
Simple Interest = 400 – 100 = 300/-
T = 16 years, Rate = ?

$$\therefore R = \frac{100 \times S.I}{P \times T} = \frac{100 \times 300}{100 \times 16} = \frac{75}{4} = 18\frac{3}{4}\%$$

10. Let principal be 100/- and Amount will be 500/-
S.I. = 500 – 100 = 400/-
Rate = 25%, Time = ?

$$\therefore T = \frac{100 \times S.I}{P \times R} = \frac{100 \times 400}{100 \times 25} = 16 \text{ years.}$$

WORK SHEET – 2 (KEY)				
1) 1	2) 1	3) 4	4) 3	5) 3
6) 1	7) 2	8) 2	9) 2	10) 3
11) 3	12) 4	13) 3	14) 3	15) 2
16) 3	17) 1	18) 3	19) 1	20) 2
21) 3	22) 2	23) 1,3	24) 2,3,4	25) 2,3,4
26) 3	27) 4	28) 1	29) 1	30) 2
31) 1	32) 3	33) 2	34) 1	35) 2
36) 2	37) 1	38) 1	39) 3,4,1,2	40) 2,3,1,4
41) 3,4,1,2	42) 16800			

1. According to definition of Simple Interest.
2. According to definition
3. According to definition
4. According to definition
5. According to definition
6. According to definition

7. Time = (22 + 30 + 21) days = 73 days = $\frac{1}{5}$ year.

   $\therefore$ S.I = Rs. $\left(1820 \times \frac{15}{2} \times \frac{1}{5} \times \frac{1}{100}\right)$ Rs. 27.30

8. Let rate = R% and time = R years. Then

   $\left(\frac{1200 \times R \times R}{100}\right) = 432 \Leftrightarrow 12R^2 = 432 \Leftrightarrow R^2 = 36 \Leftrightarrow R = 6$

9. Sum = $\left(\frac{100 \times S.I}{R \times T}\right)$ = Rs. $\left(\frac{100 \times x}{x \times x}\right)$ = Rs. $\left(\frac{100}{x}\right)$

10. S.I = Rs. (956 - 800) = Rs. 156.

    Rate = $\left(\frac{100 \times 156}{800 \times 3}\right)\% = 6\frac{1}{2}\%$.

New rate = $\left(6\frac{1}{2}+4\right)\% = 10\frac{1}{2}\%$

New S.I = Rs. $\left(800\times\frac{21}{2}\times\frac{3}{100}\right)$ = Rs. 252.

$\therefore$ New amount = Rs. (800 + 252) = Rs. 1052

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

$\therefore$ Required ratio = $\left[\frac{\left(\frac{P\times R\times 6}{100}\right)}{\left(\frac{P\times R\times 9}{100}\right)}\right] = \frac{6PR}{9PR} = \frac{6}{9} = 2:3$

12. 4000 + 94000 x 5 x 0.15) = Rs. 7000

13. $1960 = \frac{14000\times r\times 2}{100} \Rightarrow r = 7\%$

14. $6000 = \frac{P\times 12\times 1}{100} \Rightarrow r = 50000$

15. In my opinion this question should be solved by unitary method instead of making complex solution

Years	Rate of Interest	Interest
2	4%	112
2	**1%**	**28**
1	1%	14

it means the principal sum is Rs. 1400

Alternatively : $\frac{P}{100}\times 2\left[(r+4)-r\right] = 112 \Rightarrow p = 1400$

16. $P = \frac{P\times r\times 12}{100} \Rightarrow r = \frac{100}{12}$

Now, $2P = \frac{P\times 100\times t}{12\times 100} = 24$ years.

17. C.I when interest is compounded yearly

= Rs. $\left[500\times\left(1+\frac{4}{100}\right)\times\left(1+\frac{\frac{1}{2}\times 4}{100}\right)\right]$ = Rs. $\left(5000\times\frac{26}{25}\times\frac{51}{50}\right)$ = Rs. 5304.

C.I when interest is compounded half-yearly

= Rs. $\left(500\times\left(1+\frac{2}{100}\right)^3\right)$ = Rs. $\left(5000\times\frac{51}{50}\times\frac{51}{50}\times\frac{51}{50}\right)$ = Rs.5306.04.

$\therefore$ Difference = Rs. (5306.04 – 5304) = Rs. 2.04.

18. P = Rs. 15625, n = 9 months = 3 quarters, R = 16% p.a = 4% per quarter.

Amount = Rs. $\left[15625\times\left(1+\frac{4}{100}\right)^3\right]$ = Rs. $\left(15625\times\frac{26}{25}\times\frac{26}{25}\times\frac{26}{25}\right)$ = Rs. 17576.

$\therefore$ C.I = Rs. (17576 – 15625) = Rs. 1951

19. Amount = Rs. (30000 + 4347) = Rs. 34347.
Let the time be n years. Then,

$3000\left(1+\frac{7}{100}\right)^n = 34347 \Leftrightarrow \left(\frac{107}{100}\right)^n = \frac{34347}{30000} = \frac{11449}{10000} = \left(\frac{107}{100}\right)^2$

$\therefore$ n = 2 years.

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

A = 5000(1.08)(1.1)(1.12)
A = 6652.8
CI = (6652.8 – 5000) = 1652.8

21. Difference between CI and SI for 2 years = $P\left(\frac{r}{100}\right)^2$

$\therefore$ 40 = $P\left(\frac{10}{100}\right)^2 \Rightarrow$ P = 4000

22. $6000\left(\frac{10}{100}\right)^2 = 60$

23. Key : 1, 3
Sol: 220 – 200 = 20
Rs 20 is the interest on the interest of the first years

Which is Rs 100 = $\left(\frac{200}{2}\right)$; thus the rate of interest = 20%

So the actual pricipal P = 500 $\left(\text{Q } 20 = \frac{100\times r\times 1}{100}\right)$

$\left(\text{Q } 100 = \frac{P\times 20\times 1}{100} \Rightarrow P = 500\right)$

24. Key : 2, 3, 4

Sol: Time = 2years 4months = $2\frac{1}{3}$ years = $\frac{7}{3}$ years = $\frac{14}{3}$ half year= $\frac{28}{3}$ quarters

Rate = $\left(\frac{100\times 252\times 3}{1600\times 7}\right)\% = 6\frac{3}{4}\%$; Similary $R = \frac{27}{8}\%, \frac{27}{16}\%$ respectively

25. Key : 2, 3, 4

Sol: sum = $\text{Rs}\left(\frac{50\times 100}{2\times 5}\right) = \text{Rs.}500$

Amount $= Rs\left[500\times\left(1+\frac{5}{100}\right)^2\right] = Rs\left(500\times\frac{21}{20}\times\frac{21}{20}\right)$ = 551.25

$\therefore$ C.I = Rs (551.25 - 500) = Rs 51.25

26. Key : 3

Sol: Time = (22 + 30 + 21) days = 73 days = $\frac{1}{5}$ year

S.I = $Rs\left(1820\text{x}\frac{15}{2}\text{x}\frac{1}{5}\text{x}\frac{1}{100}\right) = Rs27.30$

S.I= $Rs\left(10\text{x}\frac{3}{100}\text{x}4\right) = Rs1.20$

27. Key : 4

Sol: Statement-I: principal Rs = 16000, Time = 9months = 3quaters
Rate = 20% per annum = 5% per quarter

$\therefore$ Amount = $Rs\left[16000\times(1+5/100)^3\right] = Rs\left(16000\times\frac{21}{20}\times\frac{21}{20}\times\frac{21}{20}\right)$ = Rs. 18522

C.I = Rs (18522 - 16000) = Rs 2522

Statement-II: Let the sum be Rs P then

$$P\left(1+\frac{R}{100}\right)^3 = 6690-(i)\ and\ P(1+R/100)^6 = 10035-(ii)$$

on dividing we get $(1+R/100)^3 = \frac{10035}{6690} = 3/2$

Sustituting this value in (i) we get

$P\times 3/2 = 6690(or)\,P = (6690\times 2/3) = 4460$

28. Key : 1

Statement-I: Let 3x be the cost for which he has bought.

$$\left(x+\frac{x\times 12\times 1}{100}\right)+\left(x+\frac{x\times 12\times 2}{100}\right)+x = 1092$$

$\Leftrightarrow \frac{28x}{25}+\frac{31x}{25}+x = 1092 \Leftrightarrow (28x+31x+25x)$ = (1092 x 25)

$\Leftrightarrow$ x $= \left(\frac{1092\times 25}{84}\right)$ = Rs. 325

Statement-II: S.I for 1 $\frac{1}{2}$ years = Rs (1164 - 1008) = Rs 156

S.I for 2years = Rs (156 x 2/3 x 2) = Rs 208
Principal = Rs (1008 - 208) = Rs 800
Now P = 800 T = 2 and S.I = 208

Rate = $\left(\frac{100\times 208}{800\times 2}\right)\% = 13\%$

29. Key : 1

Sol: Statement-I: Let the rate be R% P.a then

$$1200\times\left(1+\frac{R}{100}\right)^2=1348.32\Leftrightarrow\left(1+\frac{R}{100}\right)^2=\frac{134832}{120000}=\frac{11236}{10000}$$

$$\left(1+\frac{R}{100}\right)^2=\left(\frac{106}{100}\right)^2(or)1+\frac{R}{100}=\frac{106}{100}(or)R=6\%$$

Statement-II: S.I on Rs 800 for 1year = Rs (840 – 800) = Rs. 40

Rate = $\left(\frac{100\times40}{800\times1}\right)\%=5\%$

30. Key : 2

Sol: Here P = Rs. 640; r = $6\frac{1}{4}\%$, n = 2

Now $A=P\left(1+\frac{r}{100}\right)^n$ $\therefore A=6400\times\left(1+\frac{\frac{25}{4}}{100}\right)=6400\times\frac{17}{16}$ = Rs. 6,800

31. Key : 1

Sol: $A=6400\times\left(1+\frac{\frac{25}{4}}{100}\right)^2=6400\times\frac{(17)^2}{(16)^2}$

$$A=6400\times\frac{289}{256}=25\times289=7225Rs$$

32. Key : 3

Sol: The interest eaned = A - P = Rs 7225 - Rs 6400 = Rs. 825

33. Key : 2

Here P = Rs 5000 A = Rs 5600, T = 1year, R = ?

$$I=\frac{PRT}{100}\Rightarrow I=Rs\frac{5000\times R\times1}{100}\Rightarrow A-P=Rs\,50R$$

(or) Rs 5600 - Rs 5000 = Rs 50R $\therefore R=\frac{600}{50}=12$

The rate of interest per annum is 12%

34. Key : 1

For the 2nd year P = Rs 5600, T = 1year R = 12

$$I=\frac{PRT}{100}\Rightarrow T=\frac{5600\times12\times1}{100}=Rs\,56\times12=672Rs$$

35. Key : 3

Sol: For the 3rd year P = amount at the end of the 2nd year

$$=Rs\,5600+Rs\,672=6272Rs$$

Now T = 1 R = 12 so the amount at the end of the 3rd year

$$= P + I = 6272 + \frac{PRT}{100} = 6272 + \frac{6272 \times 12 \times 1}{100}$$

= Rs 7,024.64

36. Key : 2

Sol: P = Rs 30,000 R = 7 $\frac{1}{2}$%; T = 1

Interest $I = \frac{PRT}{100} = \frac{30000 \times \frac{15}{2} \times 1}{100} = 2250 Rs$

amount of the end of the first year = P + I

30,000 + 2250 = 32,250 Rs

2nd year $\frac{32,250 \times 15/2}{100} = \frac{3225 \times 15}{20} = 2418.75$

amout of end od the 2nd year = P + I

= 32,250 + 2418.75 = 34,668.75 Rs.

37. Key : 1

Sol: 3rd year P = 34668.75 ; R = 7 $\frac{1}{2}$%; T = 1

$I = \frac{PRT}{100} = \frac{34668.75 \times \frac{15}{2}}{100} = \frac{6933.75 \times 3}{8}$ = Rs. 2600.15

The required amount is = P + I = Rs. 34,668.75 + 2600.15 = Rs. 37268.90

38. Key : 1

Sol: Compound interest = A - P = Rs. 37268.90 – 30000 = Rs. 7,268.90

39. Key: a $\rightarrow$ 3; b $\rightarrow$ 4; c $\rightarrow$ 1; d $\rightarrow$ 2

a) The interest for the 1st year = 4% of Rs $46875 = \frac{4}{100} \times 46875$

$$= Rs \frac{187500}{100} = Rs 1,875$$

2) The new pricipal for the second year = Rs 46875 + Rs 1875

Rs 48750

The interest for the second year = 4% of Rs 48750

$\frac{4}{100} of\ Rs\ 48750 \Rightarrow Rs \frac{195000}{100} = Rs 1950$

$\therefore$ The amount standing to his credit at the end of the 2nd year = Rs 48750 + Rs 1950 = Rs 50,700

3) The new prcipal for the 3rd year = Rs 50700

$\therefore$ The interest for the 3rd year = 4% of Rs 50700

$= \frac{4}{100} \times RS\ 50700 = Rs \frac{202800}{100} = Rs 2,028$

4) The amount that the man will receive after 3years

= Rs 50700 + Rs 2028 = Rs 52,728

40. Key: a $\rightarrow$ 2; b $\rightarrow$ 3; c $\rightarrow$ 1; d $\rightarrow$ 4

a) The intest for the first year = I = 10% of Rs 10,000

$$Rs\frac{10}{100}\times 10000 = Rs1000$$

The amount after one year = P + I = Rs 10000 + Rs 1000 = Rs. 11,000

b) For the 2nd year the new principal is Rs 11000

Interest for the 2nd year = I = 10% of Rs 11000 = Rs $\frac{10}{100}\times 11000$ = Rs. 1100

the compound interest for 2year = the interest for the 1st year + the interest for the 2nd year = Rs 1000 + Rs 1100 = Ra 2,100

c) The required sum of money = principal + compound interest for 2years

= Rs 10000 + Rs 2100 = Rs 12,100

4) The C.I = Rs. 10,000 $\left(1+\frac{10}{100}\right)^3 - 10000 = 3310$

$\therefore$ The difference = $3310 - 3000 = 310Rs.$

41. Key: a $\rightarrow$ 3; b $\rightarrow$ 4; c $\rightarrow$ 1; d $\rightarrow$ 2

a) Here the interest is compounded half yearly so, for the first half year P = Rs60000, R = 8, T = 1/2

$$I = \frac{PRT}{100} \Rightarrow I = Rs\frac{60000\times 8\times\frac{1}{2}}{100} = Rs\frac{240000}{100} = 2400Rs$$

b) For the 2nd half year, P = amount after the first half year
= Rs 60000 + Rs 2400 = Rs 62400

R = 8 T = 1/2 $\quad I = \frac{PRT}{100} \Rightarrow I = \frac{62400\times 8\times 1/2}{100} = $ Rs. 2496

The amount after two half years ie one year
= P + I = 62400 + 2496 = Rs. 64,896

c) For the 3rd half year P = amount after 1 year = 64896 R = 8, T = 1/2

$$I = \frac{PRT}{100} \Rightarrow I = \frac{64896\times 8\times 1/2}{100} = \text{Rs. } 2595.84$$

The principal after the 3rd half yearly i.e. 1 $\frac{1}{2}$ years

amount = 64896 + 2595.84 = 67491.84

amount received after 1 $\frac{1}{2}$ years = Rs 67,491.84

4) Total interst earned in 1 $\frac{1}{2}$ years

Find amount – initial principal = 67491.84 – 60,000 = Rs. 7,491.84

42. Ans : 16800