Chapter 3

Banking

POINTS TO REMEMBER

1. Calculating Interest is a Saving Bank Account :

For money kept in Saving Bank Account, the bank pays some interest. These days, the rate of interest is 4% p.a.

Rule. In a Saving Bank Account, the minimum balance from the 10th day of each month (in a multiple of 10) qualifies for the interest during that month.

2. Method of Calculating Interest :

(*i*) Write down the minimum balance from the 10th day of each month in a multiple of Rs. 10.

(*ii*) Add all these balances.

(*iii*) Find simple interest on this sum for 1 month.

Note. (*i*) If total interest is less than Re 1, take it zero.

(*ii*) If minimum balance in a month from 10th day is Rs. 5 or less, no interest in paid for that month.

3. Recurring Deposit (R.D.) or Commulative Time Deposits (C.T.D.)

We know that $(1 + 2 + 3 + ... + n) = \frac{n(n+1)}{2}$ $\therefore$ Formula for calculating S.I. when Rs. P per month is deposited for n months at R% p.a. = Rs. $\left[P \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}\right]$

Note. We can also find the S.I. and amount payable after maturity using the tables for calculation R.D. There tables are given.

EXERCISE 3 (A)

Q. 1. Mr. S.K. Goswami has a Savings Bank Account with the Syndicate Bank. His pass book has the following entries.

Date	Particulars	Withdrawals (Debit)	Deposits (Credit)	Balance
Jan. 2, 2005	B/F	....	....	5500·00
Jan., 9	By Cheque	....	1500·00	7000·00
Jan., 17	To Cheque	4200·00	...	2800·00
Aug., 20	By Cash	....	2400·00	5200·00
Oct., 4	To Cheque	2000·00	....	3200·00

Mr. Goswami closes his account on Oct. 20, 2005. Find the net balance, he gets from the bank, the interest being paid at 4% per annum.

Sol. Principal for the month of Jan., 2005 = Rs. 2800
Principal for the month of Feb., 2005 = Rs. 2800
Principal for the month of March, 2005 = Rs. 2800
Principal for the month of April, 2005 = Rs. 2800
Principal for the month of May, 2005 = Rs. 2800
Principal for the month of June, 2005 = Rs. 2800
Principal for the month of July, 2005 = Rs. 2800
Principal for the month of Aug., 2005 = Rs. 2800
Principal for the month of Sep., 2005 = Rs. 5200
Principal for the month of Oct., 2005 = nil
Total principal for one month = Rs. 27600
Rate of interest = 4% p.a.

$$\text{Period} = 1 \text{ month} = \frac{1}{12} \text{year}$$

$$\therefore \text{ Total interest} = \frac{P.R.T}{100} = \frac{27600 \times 4 \times 1}{100 \times 12} = \text{Rs. } 92$$

$\therefore$ Net Balance to be paid = Rs. 3200 + Rs. 92 = Rs. 3292 **Ans.**

Q. 2. The entries in a Savings Bank Pass Book are as given below :

Date	Particulars	Withdrawals	Deposits	Balance
01-01-03	B/F	—	—	Rs. 14000
01-01-03	By cash	—	Rs. 11500	Rs. 25500
12-02-03	To cheque	Rs. 5000	—	Rs. 20500
05-04-03	By cash	—	Rs. 3750	Rs. 24250
15-04-03	To cheque	Rs. 4250	—	Rs. 20000
09-05-03	By cash	—	Rs. 1500	Rs. 21500
04-06-03	By cash	—	Rs. 1500	Rs. 23000

Calculate the interest for six months (January to June) at 4% p.a. on the minimum balance on or after the tenth day of each month. **(2004)**

Sol. Principal for the month of Jan. = Rs. 14000
Principal for the month of Feb. = Rs. 20500
Principal for the month of March = Rs. 20500
Principal for the month of April = Rs. 20000
Principal for the month of May = Rs. 21500
Principal for the month of June = Rs. 23000

Total principal for one month = Rs. 119500

Rate of interest = 4%

$$\text{Total interest} = \frac{P\,r\,t}{100} = \frac{119500 \times 4 \times 1}{100 \times 12}$$

= Rs. 398·33 **Ans.**

Q. 3. A page from the Savings Bank Account of Mrs. Rajni Sethi is given below :

Date	Particulars	Withdrawals (Debit)	Deposits (Credit)	Balance
Jan., 1, 2005	By Balance	—	—	3700·00
Jan., 8	By Cash	—	1500·00	5200·00
Jan., 16	By Cash	—	2500·00	7700·00
Jan., 24	To Cheque	1000·00	—	6700·00
Feb., 18	By Cash	—	1200·00	7900·00
April, 11	By Cash	—	1000·00	8900·00
April, 21	To Self	2000·00	—	6900·00
May, 6	To Cheque	1400·00	—	5500·00
May, 26	By Cash	—	2000·00	7500·00
June, 5	By Cash	—	1500·00	9000·00
June, 10	To Cheque	2500·00	—	6500·00

If she closes the account on 2nd July, 2005, how much interest she will get from the bank at 4% p.a. ?

Sol. Principal for the month of Jan., 2005 = Rs. 5200

Principal for the month of Feb., 2005 = Rs. 6700

Principal for the month of March, 2005 = Rs. 7900

Principal for the month of April, 2005 = Rs. 6900

Principal for the month of May, 2005 = Rs. 5500

Principal for the month of June, 2005 = Rs. 6500

Principal for the month of July, 2005 = nil

Total principal for one month = Rs. 38700

Rate = 4% p.a.

$$\text{Period} = 1 \text{ month} = \frac{1}{12} \text{ years.}$$

$$\therefore \text{ Interest } \frac{P.R.T.}{100} = \frac{\text{Rs.}38700 \times 4 \times 1}{100 \times 12} = \text{Rs. } 129 \textbf{ Ans.}$$

Q. 4. Given below are the entries of the pass book of the Savings Bank Account of Mr. Ved Prakash in Bank of India.

Date	Particulars	Amount Withdrawan Rs. P	Amount Deposited Rs. P	Balance Rs. P
Feb., 12, 2005	By Cash	—	1000·00	1000·00
Feb., 21	By Cash	—	3200·00	4200·00
March, 6	By Salary	—	8270·00	12470·00
March, 14	To Cheque	3500·00	—	8970·00
March, 22	To Cheque	1700·00	—	7270·00
April, 3	By Salary	—	8270·00	15540·00

If he closes his account on 24th April 2005, compute the interest at 4% per annum.

Sol. Principal for the month of Feb., 2005 = nil

Principal for the month of March, 2005 = 7270·00

Principal for the month of April, 2005 = nil

Total principal for 1 month = 7270·00

Rate of interest = 4% p.a.

$$\therefore \text{ Total Interest} = \frac{7270 \times 4 \times 1}{100 \times 12} = \text{Rs. } 24.23 \textbf{ Ans.}$$

Q. 5. Mrs. Kumar has an account with The Bank of India. The following entries are from her pass book :

Date	Particulars	Withdrawals Rs. P	Deposits Rs. P	Balance Rs. P
08. 02.06	B/F	—	—	8500.00
18.02.06	To Self	4000.00	—	.....
12.04.06	By Cash	—	2238.00	.....
15.06.06	To Self	5000.00	—	.....
08.07.06	By Cash	—	6000.00	.....

Complete the above page of her pass book and calculate the interest for the six months February to July, 2006 at 4.5% per annum. **(2007)**

Sol. Principal for the month of Feb., 2006 = 4500.00

Principal for the month of March, 2006 = 4500.00

Principal for the month of April, 2006 = 4500.00

Principal for the month of May, 2006 = 6738.00

Principal for the month of June, 2006 = 1738.00

Principal for the month of July, 2006 = 7738.00

Total principal for one month = 29714

Rate of interest $= 4\frac{1}{2}\% = 4{\cdot}5\%$

$\therefore$ Total Interest $= \text{Rs.}\frac{29714 \times 45 \times 1}{100 \times 10 \times 12} = \text{Rs. } 111{\cdot}4275 = \text{Rs. } 111{\cdot}43$ **Ans.**

6. Mr. Dhoni has an account in the Union Bank of India. The following entries are from his pass book.

Date	Particulars	Withdrawals	Deposits	Balance
Jan 3, 07	B/F	-	-	2642.00
Jan 16	To self	640.00	-	2002.00
March 5	By Cash	-	850.00	2852.00
April 10	To self	1130.00	-	1722.00
April 25	By cheque	-	650.00	2372.00
June 15	By cash	577.00	-	1795.00

Calculate the interest from January 2007 to June 2007 at the rate of 4% per annum.

Principal for the month of Jan = Rs. 2002.00

Principal for the month of Feb. = Rs. 2002.00

Principal for the month of March = Rs.2852.00

Principal for the month of April = Rs. 1722.00

Principal for the month of May = Rs. 2372.00

Principal for the month of June = Rs. 1795.00

Total principal for one month = Rs. 12745

Rate of interest = 4% p.a.

$\therefore$ Interest $= \frac{\text{Prt}}{100} = \frac{12745 \times 4 \times 1}{100 \times 12} = \text{Rs. } 42.48$ **Ans.**

Q. 7. Mr. Alok Bhatia has his Saving Bank Account in Canara Bank. Given below are the entries in his pass book :

Date	Particulars	Withdrawals Rs. P	Deposits Rs. P	Balance Rs. P
Jan., , 2003	B/F	—	—	7635·00
Jan., 17	To Cheque	4527·00	—	3108·00
Feb., 8	By Cash	—	215·00	3323·00
March, 14	By Cash	—	602·00	3925·00
May, 15	To Self	1580·00	—	2345·00
June, 7	To Cheque	219·50	—	2125·50
June, 22	By Cash	—	700·00	2825·50

Calculate the interest upto 30th June at $4\frac{1}{2}\%$ per annum.

Sol. Principal for the month of Jan., 2003 = 3108.00
Principal for the month of Feb., 2003 = 3323.00
Principal for the month of March, 2003 = 3323.00
Principal for the month of April, 2003 = 3925.00
Principal for the month of May, 2003 = 2345.00
Principal for the month of June, 2003 = 2125.50
Total principal for one month = 18149·50

Rate of interest $= 4\frac{1}{2}\% = 4{\cdot}5\%$

$\therefore$ Total interest $= \text{Rs.}\frac{18149 \times 4{\cdot}5 \times 1}{100 \times 12} = \text{Rs.}\frac{18149 \times 45}{12000}$ = Rs. 68·05875 = Rs. 68·06 **Ans.**

Q. 8. Mr. Mishra has a Savings Bank Account in Allahabad Bank. His pass book entries are as follows:

Date	Particulars	Withdrawals (in Rs.)	Deposits (in Rs.)	Balance (in Rs.)
Jan. 4, 2007	By Cash	.....	1000.00	1000.00
Jan. 11, 2007	By Cheque	.....	3000.00	4000.00
Feb. 3, 2007	By Cash	.....	2500.00	6500.00
Feb. 7, 2007	To Cheque	2000.00	.....	4500.00
Mar. 3, 2007	By Cash	.....	5000.00	9500.00
May 25, 2007	By Cash	.....	2000.00	11500.00
June 7, 2007	By Cash	.....	3500.00	15000.00
Aug. 29, 2007	To Cheque	1000.00	.....	14000.00

Rate of interest paid by the bank is 4.5% per annum. Mr. Mishra closes his account on 30th October, 2007. Find the interest he receives.

Sol. Qualifying Amount

Jan. = Rs. 1000
Feb. = Rs. 4500
March = Rs. 9500
April = Rs. 9500
May = Rs. 9500
June = Rs. 15000
July = Rs. 15000
August = Rs. 14000
September = Rs. 14000
= Rs. 92000

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

$$= \frac{92000 \times 4.5 \times 1}{12 \times 100}$$

= Rs. 345

Q. 9. Mrs. Harmeet Kaur opened a Savings Bank Account in Punjab and Sindh Bank. Her pass book entries are given below :

Date	Particulars	Withdrawals Rs. P	Deposits Rs. P	Balance Rs. P
July, 1	B/F	—	—	7563·50
July, 24	By Cash	—	2520·00	10083·50
Aug., 11	By Cash	—	700·00	10783·50
Sept., 16	To Self	7500·00	—	3283·50
Oct., 22	To Cheque	950·00	—	2333·50
Dec., 8	By Cheque	—	5774·00	8107·50
Dec., 18	To Cash	840·00	—	7267·50

Calculate the interest at 4% per annum for the period ending December.

Sol.

Principal for the month of July = 7563·50

Principal for the month of Aug. = 10083·50

Principal for the month of Sept.= 3283·50

Principal for the month of Oct. = 2333·50

Principal for the month of Nov. = 2333·50

Principal for the month of Dec. = 7267·50

Total principal for one month = Rs. 32865·00

Rate of interest = 4% p.a.

Total interest

$$= \text{Rs. } \frac{32865 \times 4 \times 1}{100 \times 12}$$

= Rs. 109·55 **Ans.**

Q. 10. Mr. Tarit Bose opened a Savings Bank Account in Bank of Baroda. His pass book entries are shown below :

Date	Particulars	Debit Rs. P	Credit Rs. P	Balance Rs. P
Feb., 12	By Cash	—	1500·00	1500·00
March, 8	By Salary	—	8375·00	9875·00
March, 15	To Self	6500·00	—	3375·00
April, 12	By Salary	—	8375·00	11750·00
April, 15	To Self	7250·00	—	4500·00
April, 20	To Cheque	238·00	—	4262·00
May, 3	By Cheque	—	875·00	5137·00
May, 14	By Salary	—	8500·00	13637·00
May, 16	To Self	9000·00	—	4637·00
June, 8	By Salary	—	8500·00	13137·00
June, 12	To Self	10000·00	—	3137·00

Mr. Bose received his transfer orders on June, 30 and closed his account on the same day. What interest does he get, the rate of interest being 4% per annum ?

Sol. Principal for the month of Feb. = nil

Principal for the month of March = 3375·00

Principal for the month of April = 3375·00

Principal for the month of May= 4637·00

Principal for the month of June = 3137·00

Total principal for one month = Rs. 14524

Rate of interest = 4% p.a.

$$\therefore \text{ Total interest} = \frac{14524 \times 4 \times 1}{100 \times 12} = \text{Rs. } 48.41 \textbf{ Ans.}$$

Q. 11. Mr. P.S. Lamba opened a Savings Bank Account in Corporation Bank. His pass book entries are shown below :

Date	Particulars	Withdrawals Rs. P	Deposits Rs. P	Balance Rs. P
Jan., 1	B/F	—	—	6360·00
Jan., 12	By Cash	—	750·00	7110·00
Feb., 15	To Self	5000·00	—	2110·00
June, 6	To Cheque	354·00	—	1756·00
July, 18	By Cheque	—	543·00	2299·00

He closed the account on 29th July and received Rs. 2354·20 as balance. Calculate the rate of interest received by him.

Sol. Principal for the month of Jan. = 6360·00
Principal for the month of Feb. = 2110·00
Principal for the month of March = 2110·00
Principal for the month of April = 2110·00
Principal for the month of May = 2110·00
Principal for the month of June = 1756·00
Principal for the month of July = Nil
Total principal for one month = Rs. 16556
Interest = Rs. 2354·20 – Rs. 2299·00 = Rs. 55·20

$$\therefore \text{Rate of interest} = \frac{\text{S.I.} \times 100}{\text{P} \times t}$$

$$= \frac{55{\cdot}20 \times 100 \times 12}{16556 \times 1} = 4\% \text{ p.a. } \textbf{Ans.}$$

EXERCISE 3(B)

Q. 1. Sohan Lal invests Rs. 300 per month for 1 year in a Recurring Deposit Account wth Syndicate Bank. If the rate of interest be 6% per annum, calculate the amount that he will get at the time of maturity.

Sol. Here, P = Rs. 300 per month
Period (n) = 12 months
Rate of interest (R) = 6%

$$\therefore \text{S.I.} = \left[\text{P} \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{\text{R}}{100}\right]$$

$$= \text{Rs.}300 \times \frac{12(12+1)}{2} \times \frac{1}{12} \times \frac{6}{100}$$

$$= \text{Rs.}300 \times \frac{12 \times 13}{2} \times \frac{1}{12} \times \frac{6}{100} = \text{Rs.}117$$

∴ Total amount payable
= Rs. 300 × 12 + S.I.
= Rs. 3600 + 117
= Rs. 3717 **Ans.**

Q. 2. Ashish deposits Rs. 250 per month for 9 months in a Cumulative Time Deposit Scheme. If the rate of interest be 8% per annum, find the amount received at the time of maturity.

Sol. Here, P = Rs. 250 per month
Period (n) = 9 months
Rate of interest (R) = 8% p.a.

$$\therefore \text{S.I.} = \left[\text{P} \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{\text{R}}{100}\right]$$

$$= \text{Rs.}250 \times \frac{9(9+1)}{2} \times \frac{1}{12} \times \frac{8}{100}$$

$$= \text{Rs.}\frac{250 \times 9 \times 10 \times 8}{2 \times 12 \times 100} = \text{Rs. } 75$$

∴ Amount payable
= Rs. 250 × 9 + Rs. 75
= Rs. 2250 + 75 = Rs. 2325 **Ans.**

Q. 3. Inderjeet opened a Cumulative Time Deposit Account with Bank of Baroda. He deposited Rs. 360 per month for 2 years. If the rate of interest be 7% per annum, how much did he get at the time of maturity.

Sol. Here, P = Rs. 360 per month
Period (n) = 2 years = 24 months
Rate (R) = 7% p.a.

$$\therefore \text{S.I.} = \text{P} \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{\text{R}}{100}$$

$$\text{Rs. } 360 \times \frac{24(24+1)}{2} \times \frac{1}{12} \times \frac{7}{100}$$

$= \text{Rs. } \frac{360 \times 24 \times 25 \times 7}{2 \times 12 \times 100}$

$= \text{Rs. } 630.$

$\therefore$ Amount payable

$= \text{Rs. } 360 \times 24 + \text{Rs. } 630$

$= \text{Rs. } 8640 + 630$

$= \text{Rs. } 9270$ **Ans.**

Q. 4. Jagdish invests Rs. 600 per month for $2\frac{1}{2}$ years in a Recurring Deposit Scheme of Corporation Bank. If the bank pays interest at $6\frac{2}{3}\%$ per annum, find the amount received by him on maturity.

Sol. Here, P = Rs. 600 per month

Period $(n) = 2\frac{1}{2}$ years

$= \frac{5}{2} \times 12 = 30$ months

Rate (R) $6\frac{2}{3}\% = \frac{20}{3}\%$ p.m.

$\therefore$ S.I. $= P \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}$

$= \text{Rs.} 600 \times \frac{30(30+1)}{2} \times \frac{1}{12} \times \frac{20}{3 \times 100}$

$= \text{Rs. } \frac{600 \times 30 \times 31 \times 20}{2 \times 12 \times 3 \times 100}$

$= \text{Rs. } 1550$

$\therefore$ Amount payable = Rs. 600 × 30 + Rs. 1550

$= \text{Rs. } (18000 + 1550)$

$= \text{Rs. } 19550$ **Ans.**

5. Mrs. Goswami deposits Rs. 1000 every month in a recurring deposit account for 3 years at 8% interest per annum. Find the matured value. (2009)

Sol.

Deposit per month (P) = Rs. 1000

Period = 3 years or 3 × 12 = 36 months

Rate of interest (R) = 8% p.a.

$\therefore$ Total principal $= \frac{P \times n(n+1)}{2}$

$= \text{Rs. } \frac{1000 \times 36(36+1)}{2}$

$= \text{Rs. } \frac{1000 \times 36 \times 37}{2} = \text{Rs. } 666000$

$\therefore$ Interest $= \frac{PRT}{100} = \frac{666000 \times 8 \times 1}{100 \times 12}$

$= \text{Rs. } 4440$

$\therefore$ Maturity value = P × n + Interest

$= 1000 \times 36 + 4440$

$= \text{Rs. } 36000 + 4440 = \text{Rs. } 40440$

Q. 6. Mohan deposits Rs. 80 per month in a cumulative deposit account for six years. Find the amount payable to him on maturity, if the rate of interest is 6% per annum. **(2006)**

Sol. P = Rs. 80, $n = 12 \times 6 = 72$ months, R = 6% p.a.

$\therefore$ Interest = Rs. $\left\{P \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}\right\}$

$= \text{Rs. } \left\{80 \times \frac{72(72+1)}{2} \times \frac{1}{12} \times \frac{6}{100}\right\}$

$= \text{Rs. } \left\{80 \times \frac{72 \times 73}{2} \times \frac{1}{12} \times \frac{6}{100}\right\}$

$= 4 \times 3 \times 73 \times \frac{6}{5} = \frac{5256}{5} = \text{Rs. } 1051.20$

Amount payable to Mohan on maturity

$= \text{Rs. } (72 \times 80 + 1051.20)$

$= 5760.00 + 1051.20 = \text{Rs. } 6811.20$ **Ans.**

Q. 7. Mr. Nair gets Rs. 6,455 at the end of one year at the rate of 14% per annum in a

recurring deposit account. Find the monthly instalment. **(2005)**

Sol. Let monthly instalment is Rs. P

here n = 1 yr = 12 months

$\therefore\ n = 12$

$$\because\ mv = \frac{n(n+1)}{2\times12}\times\frac{P\times R}{100} + P.n$$

$$6455 = \frac{12(12+1)}{2\times12}\times\frac{P\times14}{100} + P.12$$

$$6455 = \frac{13\times P\times7}{100} + P.12$$

$$\Rightarrow\quad 6455 = \frac{91P + 1200P}{100}$$

$$\Rightarrow\quad 645500 = 1291\ P$$

$$\Rightarrow\quad P = \frac{645500}{1291}$$

$\therefore$ amount deposited every month.

= Rs. 500 **Ans.**

Q. 8. Manohar has a Recurring Deposit Account in a finance company for $1\frac{1}{2}$ years at 9% per annum. If he gets Rs. 15426 at the time of maturity, how much per month has been invested by Manohar.

Sol. Let P = Rs. x

Period $(n) = 1\frac{1}{2}$ years = 18 months

Rate of interest = 9% p.a.

Amount of maturity = Rs. 15426

$$\therefore\ \text{S.I.} = P\times\frac{(n)(n+1)}{2}\times\frac{1}{12}\times\frac{R}{100}$$

$$= x\times\frac{18\times19}{2}\times\frac{1}{12}\times\frac{9}{100} = \frac{513x}{400}$$

$\therefore$ Amount after maturity

$$= 18x + \frac{513x}{400} = \frac{7200x + 513x}{400} = \frac{7713x}{400}$$

According to the condition,

$$\frac{7713}{400}x = 15426$$

$$\Rightarrow\quad x = \frac{15426\times400}{7713}$$

$$x = 800$$

Hence amount deposited every month = Rs. 800 **Ans.**

Q. 9. Mr. Jacob has a Recurring Deposit Account for 2 years at 10% per annum. If he receives Rs. 1900 as interest, find the value of the monthly instalment paid by Mr. Jacob.

Sol. Interest received at maturity = Rs. 1900

Let P = Rs. x

Period (n) = 2 years = 24 months

Rate of interest (R) = 10% p.a.

$$\therefore\ \text{S.I.} = P\times\frac{n\,(n+1)}{2}\times\frac{1}{12}\times\frac{R}{100}$$

$$= x\times\frac{24\,(24+1)}{2}\times\frac{1}{12}\times\frac{10}{100}$$

$$= \frac{x\times24\times25\times10}{2\times12\times100} = \frac{5x}{2}$$

According to the condition,

$$\frac{5x}{2} = 1900\ \Rightarrow\ x = \frac{1900\times2}{5} = \frac{3800}{5}$$

$\therefore\ x = 760$

Hence amount deposited every month = Rs. 760 **Ans.**

Q. 10. Malti has a Cumulative Time Deposit Account and deposits Rs. 240 per month for 2 years. If at the time of maturity, she gets Rs. 6300, find the rate of interest.

Sol. Here P = Rs. 240

Period = 2 years = 24 months

Amount on maturity = Rs. 6300

Let rate of interest (R) = x%

$$\therefore\ \text{S.I.} = P\times\frac{n(n+1)}{2}\times\frac{1}{12}\times\frac{R}{100}$$

$$= 240 \times \frac{24 \times (24+1)}{2} \times \frac{1}{12} \times \frac{x}{100}$$

$$= \frac{240 \times 24 \times 25 \times x}{2 \times 12 \times 100} = 60x$$

But interest = Amount – Principal

$= 6300 - 240 \times 24$

$= 6300 - 5760 = \text{Rs. } 540$

According to the condition,

$60x = 540$

$\Rightarrow \quad x = \frac{540}{60} = 9$

$\therefore$ Rate of interest = 9% p.a. **Ans.**

Q. 11. Mr. Thomas has a 4 years Cumulative Time Deposit Account in Punjab and Sindh Bank and deposits Rs. 650 per month. If he receives Rs. 36296 at the time of maturity, find the rate of interest.

Sol. Here, P = Rs. 650 per month

Period (n) = 4 years = 48 months

Let rate of interest = x% p.a.

Amount received on maturity = Rs. 36296

$\therefore$ S.I. = Rs. $(36296 - 650 \times 48)$

= Rs. $(36296 - 31200)$ = Rs. 5096

Now, S.I. $= P \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}$

$\Rightarrow 5096 = 650 \times \frac{48(48+1)}{2} \times \frac{1}{12} \times \frac{x}{100}$

$\Rightarrow 5096 = \frac{650 \times 48 \times 49 \times x}{2 \times 12 \times 100}$

$\Rightarrow \quad x = \frac{5096 \times 2 \times 12 \times 100}{650 \times 48 \times 49} = 8$

$\therefore$ Rate of interest = 8% p.a. **Ans.**

Q. 12. Kavita has a Cumulative Time Deposit Account in Corporation Bank. She deposits Rs. 600 per month and gets Rs. 6165 at the time of maturity. If the rate of interest be 6% per annum, find the total time for which the account was held.

Sol. P = Rs. 600 p.m.

Amount received on maturity = Rs. 6165

Rate of interest = 6%

Let period = n months

$\therefore$ S.I. = A – P × n = $6165 - 600n$

But S.I. $= P \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}$

$\Rightarrow = 600 \times \frac{(n)\ (n+1)}{2} \times \frac{1}{12} \times \frac{6}{100}$

$= \frac{3(n^2+n)}{2}$

According to the condition,

$6165 - 600n = \frac{3}{2}(n^2+n) \quad = \frac{3n^2+3n}{2}$

$3n^2 + 3n = 12330 - 1200n$

$3n^2 + 1203n - 12330 = 0$

$n^2 + 401n - 4110 = 0$

$\Rightarrow \quad n^2 + 411n - 10n - 4110 = 0$

$\Rightarrow n(n+411) - 10(n+411) = 0$

$\Rightarrow \quad (n-10)(n+411) = 0$

(Zero product rule)

Either $n - 10 = 0$, then $n = 10$

or $n + 411 = 0$, then $n = -411$ which is not possible.

Hence no. of months = 10 **Ans.**

Q.13. Sekhar has a Recurring Deposit Account in a bank. He deposits Rs. 800 per month and gets Rs. 15198 as maturity value. If the rate of interest be 7% per annum, find the total time for which the account was held.

Sol. Here, P = Rs. 800 per month

Rate of interest = 7% p.a.

Maturity value = Rs. 15198

Let no. of months = n

$\therefore$ S.I. = A – P × n

$\therefore$ S.I. = $15198 - 800n$

But S.I. $= P \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{R}{100}$

$$= 800 \times \frac{n(n+1)}{2} \times \frac{1}{12} \times \frac{7}{100}$$

$$= \frac{7}{3}(n^2 + n)$$

According to the condition,

$$\frac{7}{3}(n^2 + n) = 15198 - 800n$$

$$\Rightarrow 7n^2 + 7n = 3 \times 15198 - 3 \times 800n$$

$$\Rightarrow 7n^2 + 7n = 45594 - 2400n$$

$$\Rightarrow \quad 7n^2 + 7n + 2400n - 45594 = 0$$

$$\Rightarrow \quad 7n^2 + 2407n - 45594 = 0$$

$$\Rightarrow 7n^2 - 126n + 2533n - 45594 = 0$$

$$\Rightarrow 7n^2 (n - 18) + 2533 (n - 18) = 0$$

$$\Rightarrow \quad (n - 18)(7n + 2533) = 0$$

(Zero product rule)

Either $n - 18 = 0$, then $n = 18$

or $7n + 2533 = 0$, $7n = -2533$

$\Rightarrow n = \frac{2533}{7}$ But it is not possible

$\therefore \ n = 18$

Hence period = 18 months **Ans.**