# Banking 2

## STUDY NOTES

- In a recurring deposit account, interest is calculated using the following formula:

  **Formula :** Suppose ₹P is deposited each month for $n$ months at R% p.a., then

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

- Maturity value (M.V.) = (P × $n$) + S.I.

## QUESTION BANK

### A. Multiple Choice Questions [1 Mark]

**Choose the correct option:**

**1.** Sujata has a recurring deposit account in a bank for 2 years at 6% p.a. simple interest. If she gets ₹1200 as interest at the time of maturity, then her monthly instalment is:

(a) ₹500 (b) ₹600 (c) ₹700 (d) ₹800

**2.** A man deposited ₹1000 per month in a recurring deposit account for 3 years at 8% p.a. The maturity value is :

(a) ₹44,000 (b) ₹40,000 (c) ₹40,440 (d) ₹44,444

**3.** Abhinav deposited ₹200 per month for 3 years in a bank's recurring deposit account. If the bank pays interest at the rate of 11% p.a., then the interest earned at the time of maturity is:

(a) ₹1210 (b) ₹1221 (c) ₹1415 (d) ₹1521

**4.** Kamal has a recurring deposit account in a bank for 2 years at 6% p.a. S.I. If he gets ₹1350 as interest, then the monthly instalment is :

(a) ₹1000 (b) ₹900 (c) ₹850 (d) ₹800

**5.** If Kavita deposited ₹900 per month for $2\frac{1}{2}$ years in a recurring deposit account, then the total money she deposited in the account is :

(a) ₹26,000 (b) ₹27,000 (c) ₹28,000 (d) ₹30,000

**6.** A man deposited ₹$x$ per month for $y$ years in a recurring deposit account. If at the time of maturity he got ₹$z$ as interest, then the total maturity amount is :

(a) ₹$(12xy + z)$ (b) ₹$12xyz$ (c) ₹$(xy + 12z)$ (d) ₹$\frac{xyz}{12}$

**7.** Karan deposited ₹2000 per month for 3 years in a recurring deposit account. If the rate of interest is 11% p.a., the amount he gets on maturity is :

(a) ₹72,000 (b) ₹80,000 (c) ₹82,210 (d) ₹84,210

**8.** A man deposits ₹2000 per month in a recurring deposit account for 18 months at 8% p.a. The interest he will get at the time of maturity is :

(a) ₹2280 (b) ₹2350 (c) ₹2400 (d) ₹2410

**9.** Mr Awasthi has a 4 year time deposit account and deposits ₹650 per month. If he received ₹5096, as interest at the time of maturity, the rate of interest is :

(a) 8% p.a. (b) 8.5% p.a. (c) 9% p.a. (d) 10% p.a.

**10.** Sharda deposited ₹150 per month in a bank for 8 months under the recurring deposit scheme. If the rate of interest is 8% p.a., then interest earned at the time of maturity is :

(a) ₹50 (b) ₹40 (c) ₹36 (d) ₹30

**11.** Ravi has a 4 year cumulative time deposit account and deposits ₹650 per month. If he receives ₹36,296 at the time of maturity, the rate of interest was:

(a) 10% p.a. (b) 9% p.a. (c) 8% p.a. (d) 7.5 % p.a.

**12.** Piyush has a recurring deposit account for 2 years at 10% p.a. If he receives ₹1900 as interest, the monthly instalment paid by him is :

(a) ₹700 (b) ₹750 (c) ₹760 (d) ₹800

**13.** A man deposited ₹1500 every month in a bank for 8 months under the recurring deposit scheme. If the rate of interest is 8% p.a., then the interest earned at the time of maturity is :

(a) ₹400 (b) ₹350 (c) ₹360 (d) ₹320

**14.** Kamal deposits ₹4,000 per month in a recurring deposit account for $1\frac{1}{2}$ years at 6% p.a. The interest he will receive at the time of maturity is :

(a) ₹3,420 (b) ₹3,240 (c) ₹3,150 (d) ₹3,110

**15.** Garima deposited ₹500 per month in a recurring deposit account for 3 years. If the rate of interest is 4%, p.a., then the amount she gets at the time of maturity is :

(a) ₹1,110 (b) ₹19,110 (c) ₹20,150 (d) ₹21,110

**16.** Amrita deposited ₹1600 per month in a recurring deposit account for 2 years. If the rate of interest is 8% p.a., then the interest earned by her at the time of maturity is :

(a) ₹3,200 (b) ₹3,450 (c) ₹3,550 (d) ₹3,600

**17.** Manisha deposited ₹500 per month in a recurring deposit account for 2 years. If the bank pays interest at 8% p.a., then the interest she gets at the time of maturity is :

(a) ₹1,000 (b) ₹1,100 (c) ₹1,200 (d) ₹1,500

**18.** Ajay deposited ₹2400 per month for 18 months in a bank's recurring deposit account. If the bank pays interest at 6% p.a., the interest he gets at the time of maturity is :

(a) ₹1,550 (b) ₹18,000 (c) ₹2,052 (d) ₹3,250

**19.** Sameer has a recurring deposit account in a bank for 3 years at 4% p.a. simple interest. If he gets ₹4,440 as interest at the time of maturity, then the monthly instalment is :

(a) ₹2,000 (b) ₹26,000 (c) ₹3,000 (d) ₹3,200

**20.** Dinesh has a recurring deposit account, which pays interest at 5% p.a. If he pays ₹2500 per month for 2 years, then the interest he will get at the time of maturity is :

(a) ₹3,000 (b) ₹3,025 (c) ₹3,200 (d) ₹3,125

### Answers

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|---|---|---|---|---|---|---|---|---|---|
| **1.** (d) | **2.** (c) | **3.** (b) | **4.** (b) | **5.** (b) | **6.** (a) | **7.** (d) | **8.** (a) | **9.** (a) | **10.** (c) |
| **11.** (c) | **12.** (c) | **13.** (c) | **14.** (a) | **15.** (b) | **16.** (a) | **17.** (a) | **18.** (c) | **19.** (a) | **20.** (d) |

## B. Short Answer Type Questions [3 Marks]

**1.** Rekha opened a recurring deposit account for 20 months. The rate of interest is 9% per annum and Rekha receives ₹441 as interest at the time of maturity. Find the amount Rekha deposited each month.

**Sol.** Interest, (I) = ₹441, Time ($n$) = 20, Rate of interest (R) = 9%

Let the amount deposited each month by Rekha be P, then,

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

$$\Rightarrow\ 441 = \frac{P \times 20\,(20+1)}{2} \times \frac{1}{12} \times \frac{9}{100}$$

$$\Rightarrow 441 = \frac{63P}{40} \Rightarrow P = ₹280.$$

**2.** Mr. Sonu has a recurring deposit account and deposits ₹750 per month for 2 years. If he gets ₹19,125 at the time of maturity, find the rate of interest.

**Sol.** Principal (P) = ₹750, Time ($n$) = 2 × 12 = 24 months.

Total amount i.e; maturity value (M.V.) = ₹19,125

M.V. = P × $n$ + S. I.

$$\Rightarrow 19{,}125 = 750 \times 24 + \frac{P \times n\,(n+1)}{2 \times 12} \times \frac{R}{100}$$

$$\Rightarrow 19{,}125 = 18{,}000 + \frac{750 \times 24\,(24+1)}{24} \times \frac{R}{100} \Rightarrow 1125 = \frac{375\,R}{2} \Rightarrow R = 6\% \text{ p.a.}$$

**3.** Kabeer opened a recurring deposit account in a bank and deposited ₹300 per month for two years. If he received ₹7,725 at the time of maturity, find the rate of interest per annum.

**Sol.** P = ₹300, Time ($n$) = 2 × 12 = 24 months, M. V. = ₹7725

$\therefore$ P × $n$ + S. I. = 7725

$$\Rightarrow 300 \times 24 + \frac{P \times n\,(n+1)}{2 \times 12} \times \frac{R}{100} = 7725$$

$$\Rightarrow \frac{300 \times 24\,(24+1)}{2 \times 12} \times \frac{R}{100} = 525 \Rightarrow 75R = 525 \Rightarrow R = 7\% \text{ p.a.}$$

**4.** Ram deposits ₹1000 per month in a recurring deposit account for 3 years at 8% per annum interest. Find the maturity value.

**Sol.** P = ₹1000, Time ($n$) = 3 × 12 = 36 months, R = 8% p.a.

Maturity value = P × $n$ + S. I.

$$= P \times n + \frac{P \times n\,(n+1)}{2 \times 12} \times \frac{R}{100} = 1000 \times 36 + \frac{1000 \times 36\,(36+1)}{2 \times 12} \times \frac{8}{100} = ₹36{,}000 + ₹4{,}440 = ₹40{,}440.$$

**5.** Reema deposited ₹200 per month for 3 years in a bank's recurring deposit account. If the bank pays interest at the rate of 11% p.a., find the amount she gets on maturity.

**Sol.** P = ₹200, Time ($n$) = 3×12 = 36 months, R = 11% p.a.

Maturity value = P × $n$ + S. I.

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

$$= 200 \times 36 + \frac{200 \times 36\,(36+1)}{2 \times 12} \times \frac{11}{100} = ₹7200 + ₹1221 = ₹8421.$$

**6.** Harishankar opened a recurring deposit account in a bank and deposited ₹800 per month for 18 months. If he received ₹15,084 at the time of maturity, find the rate of interest per annum.

**Sol.** P = ₹800, Time ($n$) = 18 months, M.V. = ₹15,084

S.I. = M. V. – P × $n$

$$\Rightarrow \frac{P \times n\,(n+1)}{2 \times 12} \times \frac{R}{100} = ₹(15084 - 800 \times 18)$$

$$\Rightarrow \frac{800 \times 18\,(18+1)}{24} \times \frac{R}{100} = 684 \Rightarrow R = 6\% \text{ p.a.}$$

## C. Long Answer Type Questions [4 Marks]

**1.** Mohan has a recurring deposit account in a bank for 2 years at 6% p.a. simple interest. If he gets ₹1200 as interest at the time of maturity, find :

(a) the monthly instalment

(b) the amount of maturity

**Sol.** (a) (I) = ₹1200, R = 6% p.a., Time ($n$) = 2 ×12 = 24 months

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

$$\Rightarrow 1200 = \frac{P \times 24\,(24+1)}{2 \times 12} \times \frac{6}{100} \Rightarrow P = ₹800.$$

(b) Amount of maturity = P × $n$ + I = ₹(800 × 24 + 1200) = ₹20,400.

**2.** Priyanka has a recurring deposit account of ₹1,000 per month at 10% per annum. If she gets ₹5,550 as interest at the time of maturity, find the total time for which the account was held.

**Sol.** P = ₹1000, R = 10% p.a., I = ₹5550

$$\because I = \frac{P \times n\,(n+1)}{2\times12} \times \frac{R}{100} \Rightarrow 5{,}550 = \frac{1000 \times n(n+1)}{24} \times \frac{10}{100}$$

$\Rightarrow n\,(n+1) = 1332$

$\Rightarrow n^2 + n - 1332 = 0$

$\Rightarrow (n-36)\,(n+37) = 0$

$\Rightarrow n$ = 36 months or 3 years.

**3.** Manish opened a recurring deposit account in a bank. He deposited ₹2500 per month for two years. At the time of maturity, he got ₹67,500. Find:

(a) the total interest earned by Manish

(b) the rate of interest per annum.

**Sol.** P = ₹2500, Time ($n$) = 2 × 12 = 24 months, M. V. = ₹67,500

(a) Total interest = M.V. – P × $n$ = ₹(67,500 – 2500 × 24) = ₹7500.

(b) Interest = $\frac{P \times n\,(n+1)}{2\times12} \times \frac{R}{100}$

$$\Rightarrow \frac{2500 \times 24\,(24+1)}{24} \times \frac{R}{100} = 7500 \Rightarrow R = 12\%\text{ p.a.}$$

**4.** Mr Gupta has a recurring deposit account in a bank. He deposits ₹2500 per month for two years. If he gets ₹66,250 at the time of maturity, find:

(a) the interest paid by the bank

(b) the rate of interest.

**Sol.** P = ₹2500, Time (n) = 2 × 12 = 24 months, M. V. = ₹66,250

(a) Interest = M.V. – P × $n$

= ₹(66,250 – 2,500 × 24) = ₹6,250.

(b) Interest = $\frac{P \times n\,(n+1)}{2\times12} \times \frac{R}{100} \Rightarrow 6250 = \frac{2500 \times 24\,(24+1)}{24} \times \frac{R}{100} \Rightarrow 6250 = 625\,R \Rightarrow R = 10\%$ p.a.

**5.** Mr Garg deposits a certain sum of money each month in a recurring deposit account of a bank. If the rate of interest is 8% p.a, and Mr Garg gets ₹8,088 from the bank after 36 months, find the value of his monthly instalment.

**Sol.** R = 8% p.a., M.V. = ₹8,088, Time ($n$) = 36 months

Let the monthly instalment be ₹ P.

Then, $8{,}088 - 36P = \frac{P \times 36 \times 37 \times 8}{2 \times 12 \times 100} \Rightarrow 8{,}088 - 36\,P = \frac{111\,P}{25}$

$\Rightarrow$ 111P = 2,02,200 – 900P $\Rightarrow$ P = $\frac{2,02,200}{1011}$ = 200.

Hence, value of each instalment = ₹200.

**6.** Vandana has a recurring time deposit account of ₹340 per month at 6% p.a. If she gets ₹7157 at the time of maturity, find the total time for which the account was held.

**Sol.** P = ₹340, R = 6%, M.V. = ₹7157.

$\because$ M.V. = P $\times$ $n$ + $\frac{\text{P} \times n\,(n+1)}{2 \times 12}$ $\times$ $\frac{\text{R}}{100}$ $\Rightarrow$ 7157 = 340 $n$ + $\frac{340\,n\,(n+1)}{24}$ $\times$ $\frac{6}{100}$

$\Rightarrow$ 7157 = $\frac{6800n + 17n^2 + 17n}{20}$ $\Rightarrow$ $17n^2 + 6817n - 1,43,140 = 0$

$\Rightarrow$ $n^2 + 401n - 8420 = 0$ $\Rightarrow$ $(n + 421)\,(n - 20) = 0$

$n - 20 = 0 \Rightarrow n = 20$.

So, the account was held for 20 months.

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