Chapter 3. Banking

Formulae

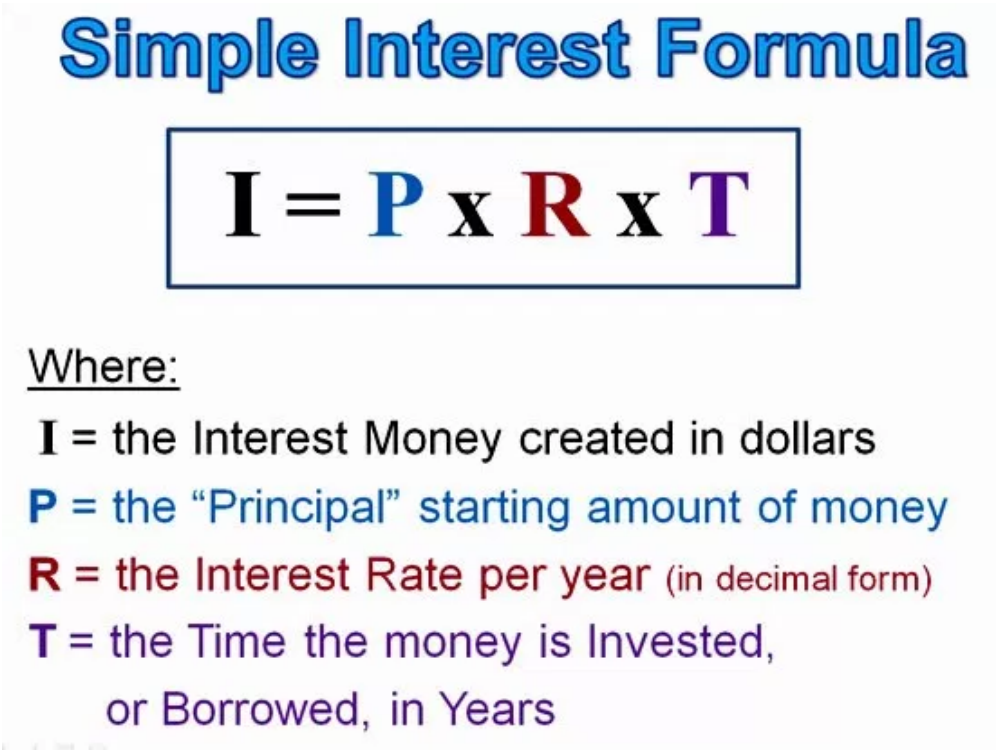
Calculating interest on a savings bank account:

1. Interest for the month is calculated on the minimum balance between the 10th day and the last day of the month.
2. Add all these balances. However, if the same balance continues for n months then multiply this balance by n, rather than writing it n times and then adding.
3. Find simple interest on this sum for one month.
4. If the interest is less than Rs. 1, neglect it.
5. No interest is paid for the month in which the account is closed.

Calculation of maturity amount on recurring deposit:
The interest on the recurring deposit account can be calculated by using the formula:

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

where S.I. is the simple interest, P is the money deposited per month, n is the number of months for which the money has been deposited and r is the simple interest rate percent per annum.



$$SI = \frac{P \times R \times T}{100} \qquad A = P + SI$$

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

where,
SI = Simple Interest P = Principal R = Rate T = Time A = Amount

Formulae Based Questions

Question 1. Naseem has a 5 years Recurring Deposit account in Punjab National Bank and deposit? Rs. 240 per month. If she receives Rs. 17,694 at the time of maturity find the rate of interest.

Solution : Here if $r\%$ be the rate of interest.
Maturity value

$$= ₹\,(240 \times 60) + ₹\left(240 \times \frac{60 \times 61}{2 \times 12} \times \frac{r}{100}\right)$$

$$17{,}694 = 14{,}400 + 366r$$
$$366r = 3{,}294$$
$$r = 9\%.$$ Ans.

Question 2. Zafarullah has a recurring deposit The list price of the television be? 12,500. account in a bank for 3½ years at 9.5% S.I. p.a. If he gets Rs. 78,638 at the time of maturity. Find the monthly instalment.

Solution : Let the monthly instalment be of ₹ x
then,
Maturity value

$$= ₹\,(x \times 42) + ₹\left(x \times \frac{42 \times 43}{2 \times 12} \times \frac{19}{200}\right)$$

$$\Rightarrow \quad 78{,}638 = 42x + \frac{5{,}719x}{800}$$
$$\Rightarrow \frac{39{,}319}{800}x = 78{,}638$$
$$\Rightarrow \quad x = 1600$$
Hence, the monthly instalment was of ₹ 1600.

Question 3. Mohan saves Rs. 25 per month from his pocket allowance and puts this saving every month in a bank recurring deposit scheme for a period of 72 months at 5.25%. What amount does he get on maturity?

Solution: See the table of Recurring deposit scheme. Here the month by instalment is Rs. 25 and the number of instalments is 72.
So the maturity value is the amount given in the table against the row marked 72 and the

column marked 25. This amount is 2,721.90.
Hence, on maturity, Mohan gets Rs. 2,721.90.

Question 4. Using R.D., table calculate the values of a R.D., account of Rs. 80 for period of 9 months @ 11.5% p. a.

Solution: In the row of 80 we will locate the value under the column of 9 months which is 755. So, maturity values of RD., account of 80 for 9 months @ 11.5% p.a Rs. 755.00.

Question 5. Veena deposits Rs. 100 per month in a bank cumulative time deposit scheme for a period of 5 years. What amount does she get on maturity if the rate of interest is 16%?

Solution: See the table of RD. scheme. For a monthly installment of Rs. 1oo per month the maturity values after 5 years is Rs. 8,447.80.

Question 6. Mrs. Goswami deposits Rs. 1000 every month in a recurring deposit account for 3 years at 8% interest per annum. Find the matured value.

Solution : $P = \frac{36\,(36+1)}{2} \times 1{,}000$

$$\text{Interest} = \frac{36 \times 37 \times 1{,}000 \times 8}{2 \times 12 \times 100}$$

$$= 12 \times 37 \times 10 = 4{,}440$$

$$\text{Matured value} = 36{,}000 + 4{,}440$$

$$= ₹\,40{,}440. \quad \text{Ans.}$$

Question 7. Amit deposited Rs. 150 per month in a bank for 8 months under the Recurring Deposit Scheme. What will be the maturity value of his deposits, if the rate of interest is 8% per annum and interest is calculated at the end of every month?

Solution : Interest on his deposit

$$= \frac{n\,(n+1)}{2} \times \frac{\text{Instalment} \times \text{Rate}}{100 \times 12}$$

$$= \frac{8\,(8+1)}{2} \times \frac{150}{100} \times \frac{8}{12}$$

$$= \frac{8 \times 9 \times 150 \times 8}{2 \times 100 \times 12} = ₹\,36$$

$$\text{Maturity value} = ₹\,150 \times 8 + 36$$

$$= ₹\,1{,}200 + ₹\,36$$

$$= ₹\,1{,}236.$$

Question 8. Kiran deposited 200 per month for 36 months in a bank's recurring deposit account. If the bank pays interest at the rate of 11% per annum, find the amount she gets on maturity.

$$\text{Solution : Interest} = \frac{P\,n\,(n+1)\times R}{2{,}400}$$

$$= \frac{200\times 36\times 37\times 11}{2{,}400}$$

$$= 3\times 37\times 11 = ₹\,1{,}221$$

$$\text{Sum deposited} = 36\times 200 = ₹\,7{,}200$$

$$\Rightarrow \quad \text{Amount} = 7{,}200 + 1{,}221$$

$$= ₹\,8{,}421.$$

Data Based Questions

Question 1. Given below are the entries in a Savings Bank A/c pass book:

Date	Particulars	Withdrawals	Deposits	Balance
Feb 8	B/F	—	—	₹ 8,500
Feb 18	To self	₹ 4,000	—	—
April 12	By cash	—	₹ 2,230	—
June 15	To self	₹ 5,000	—	—
July 8	By cash	—	₹ 6,000	—

Calculate the interest for six months from February to July at 6% p.a.

Solution:

Date	Particulars	Withdrawals	Deposits	Balance
Feb. 8	B/F	—	—	₹ 8,500
Feb. 18	To Self	₹ 4,000	—	₹ 4,500
April 12	By Cash	—	₹ 2,230	₹ 6,730
June 15	To Self	₹ 5,000	—	₹ 1,730
July 8	By Cash	—	₹ 6,000	₹ 7,730

Qualifying amount for interest

for the month of February	=	₹ 4,500
for the month of March	=	₹ 4,500
for the month of April	=	₹ 4,500
for the month of May	=	₹ 6,730
for the month of June	=	₹ 1,730
for the month of July	=	₹ 7,730
Total		₹ 29,690

$$\text{Interest} = \frac{29{,}690\times 6\times 1}{100\times 12}$$

$$= ₹\,148{\cdot}45. \qquad \text{Ans.}$$

Question 2. Mr. Dhoni has an account in the Union Bank of India. The following entries are from his pass book:

Date	Particulars	Withdrawals (in ₹)	Deposits (in ₹)	Balance (in ₹)
Jan. 3, 07	B/F	—	—	2,642·00
Jan. 16	To self	640·00	—	2,002·00
March 5	By Cash	—	850·00	2,852·00
April 10	To self	1130·00	—	1,722·00
April 25	By cheque	—	650·00	2,372·00
June 15	By cash	577·00	—	1,795·00

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

Solution : Qualifying amount for

Jan.	2007	=	₹ 2,002
Feb.	2007	=	₹ 2,002
March	2007	=	₹ 2,852
April	2007	=	₹ 1,722
May	2007	=	₹ 2,372
June	2007	=	₹ 1,795
		Total	₹ 12,745

₹ 12,745 is treated as principal of one month for calculating the interest.

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

$$= \frac{12{,}745 \times 4 \times 1}{12 \times 100}$$

$$= ₹\ 42{\cdot}483$$

$$= ₹\ 42{\cdot}48$$

Question 3. Anita opens an S.B. account in State Bank of India on August 1, 1983 with Rs. 100. She deposits Rs. 100 on the first or second day every month till and including February 1,1984. In between she withdrawal Rs. 200 on October 17,1983 and also on January 13,1984. Write the entries of the passbook.

Solution: The entries in the pass book are given below:

Date	Particulars	Withdrawals (₹)	Deposits (₹)	Balance (₹)
Aug. 1, 1983	By cash	—	100·00	100·00
Sept. 2	By cash	—	100·00	200·00
Oct. 1	By cash	—	100·00	300·00
Oct. 3	By interest	—	0·83	300·83
Oct. 17	To cheque	200·00	—	100·83
Nov. 1	By cash	—	100·00	200·83
Dec. 1	By cash	—	100·00	300·83
Jan. 2, 1984	By cash	—	100·00	400·83
Jan. 13	To cheque	200·00	—	200·83
Feb. 1	By cash	—	100·00	300·83
Oct. 1	By interest	—	13·40	314·23

Question 4. Akash, an employee of a bank, has a saving bank account in his bank that pays him
interest at the rate of 5% p.a., which is compounded every June and December. His pass book entries are as follow:

Date	Particulars	Withdrawals (₹)	Deposits (₹)	Balance (₹)
Feb. 3, 1981	By cash	—	500·00	500·00
Feb. 7	To cheque no. 371	200·00	—	300·00
Feb. 11	By cheque	—	700·00	1,000·00
March 1	By salary	—	2,350·00	3,350·00
March 4	To withdrawal slip	1,500·00	—	1,850·00
March 31	To Urmil	150·00	—	1,700·00
April 1	By salary	—	2,350·00	4,050·00
April 2	To Sri Ram	1,800·00	—	2,250·00
May 1	By salary	—	2,350·00	4,600·00
May 3	To accountant	2,000·00	—	2,600·00

Calculate the interest due at the end of June and find the balance on July 1, if he deposits a cash of ?100 on July 1, which is also entered immediately.

Solution:

Principal for the month of Feb. = ₹ 300

Principal for the month of March = ₹ 1,700

Principal for the month of April = ₹ 2,250

Principal for the month of May = ₹ 2,600

Principal for the month of June = ₹ 2,600

Total = ₹ 9,450

Principal for one month = ₹ 9,450

Rate (R) = 5%

$$\text{Interest at the end of June (I)} = \frac{P \times R \times T}{100}$$

$$= ₹ \frac{9{,}450 \times 5}{100} \times \frac{1}{12}$$

= ₹ 39·38

Balance on July 1 = ₹ (2,600 + 39·38 + 100)

= ₹ 2,739·38.

Question 5. Mr. Chaudhary opened a Saving's Bank Account at State Bank of India on 1st April 2007.

Date	Particulars	Withdrawals (in ₹)	Deposits (in ₹)	Balance (in ₹)
1st April 2007	By Cash	—	8,550·00	8,550·00
12th April 2007	To Self	1,200·00	—	7,350·00
24th April 2007	By Cash	—	4,550·00	11,900·00
8th July 2007	By Cheque	—	1,500·00	13,400·00
10th Sept. 2007	By Cheque	—	3,500·00	16,900·00
17th Sept. 2007	To Cheque	2,500·00	—	14,400·00
11th Oct. 2007	By Cash	—	800·00	15,200·00
6th Jan. 2008	To Self	2,000·00	—	13,200·00
9th March 2008	By Cheque	—	950·00	14,150·00

If the bank pays interest at the rate of 5% per annum, find the interest paid on 1st April, 2008. Give your answer correct to the nearest rupee.

Minimum balance for the month of April = ₹ 7,350
Minimum balance for the month of May = ₹ 11,900
Minimum balance for the month of June = ₹ 11,900
Minimum balance for the month of July = ₹ 13,400
Minimum balance for the month of Aug. = ₹ 13,400
Minimum balance for the month of Sept. = ₹ 14,400
Minimum balance for the month of Oct. = ₹ 14,400
Minimum balance for the month of Nov. = ₹ 15,200
Minimum balance for the month of Dec. = ₹ 15,200
Minimum balance for the month of Jan. = ₹ 13,200
Minimum balance for the month of Feb. = ₹ 13,200
Minimum balance for the month of March = ₹ 14,150
Total ₹ 1,57,700

$\Rightarrow$ Principal for one month = ₹ 1,57,700

$$\text{Interest paid on 1st April} = \frac{1,57,700 \times 5 \times 1}{100 \times 12}$$

= ₹ 657·08

= ₹ 657 (to the nearest rupee)

Question 6. A page of Passbook of Mrs. C. Malik Savings Bank Account in year 2002 is given below:

Date Year 2002	Particulars	Amount Withdrawn (in ₹)	Amount Deposited (in ₹)	Balance (in ₹)
Jan. 1	By Balance	—	—	2,100·00
Jan. 7	By Cash	—	1,000.00	3,100·00
Feb. 1	By Cash	—	500.00	3,600·00
Feb. 15	To Cheque	2,000.00	—	1,600·00
March 15	By Cash	—	2,000.00	3,600·00
March 20	To Cheque	1,000.00	—	2,600·00
June 12	By Cash	—	3,000.00	5,600·00
June 28	To Cheque	1,000.00	—	4,600·00
Oct. 15	To Cheque	3,000.00	—	1,600·00
Nov. 5	By Cash	—	1,500.00	3,100·00
Dec. 10	By Cash	—	500.00	3,600·00
Dec. 20	To Cheque	1,000.00	—	2,600·00

If the rate of interest decreases from 5% to 4% with effect from June 1st, 2002, compute the interest at the end of the year.

Solution: As per entries of the Passbook page of Mrs. C. Malik, we have:

Month	Minimum Balance between 10th day and the last day (in ₹)	Qualifying Amount for interest (in ₹)
Jan.	3,100	3,100
Feb.	1,600	3,200
March	1,600	
April	2,600	5,200
May	2,600	
June	2,600	2,600
July	4,600	13,800
Aug.	4,600	
Sept.	4,600	
Oct.	1,600	1,600
Nov.	3,100	3,100
Dec.	2,600	2,600

Qualifying amount for interest at the rate of 5% = ₹ 11,500.
(from January to May)

$$\therefore \quad \text{Interest} = ₹\ \frac{11{,}500 \times 5 \times 1}{100 \times 12} = ₹\ 47.92$$

Qualifying amount for interest at the rate of 4% = ₹ 23,700.
(from June to December)

$$\therefore \quad \text{Interest} = ₹\ \frac{23{,}700 \times 4 \times 1}{100 \times 12} = ₹\ 79$$

$$\therefore \quad \text{Interest at the end of the year} = ₹\ 47.92 + ₹\ 79 = ₹\ 126.92$$ Ans.

Question 7. Suresh has joined a factory which pays wages by cheque only. He opens a S.B. account on Feb. 1, and his passbook has the following entries Upto 1st April of the year.

Date	Particulars	Withdrawals (₹)	Deposits (₹)	Balance (₹)
Feb. 1	By cash	—	50·00	50·00
Feb. 2	By salary	—	1,000·00	1,050·00
Feb. 4	To withdrawn slip	200·00	—	850·00
Feb. 15	By overtime allowance	—	300·00	1,150·00
Feb. 24	To Aslam	100·00	—	1,050·00
March 1	By salary	—	1,000·00	2,050·00
March 7	To cheque no. 212	500·00	—	1,550·00
March 21	To cheque no. 213	700·00	—	850·00
March 27	To self	400·00	—	450·00
Apr. 1	By salary	—	1,000·00	1,450·00
Apr. 11	By Interest	—	—	—

He closes the account on 11th April. Complete the entries for 11th April at the rate of 5% p.a.

Solution : Principal for the month of February = ₹ 850·00

March = ₹ 450·00

Total ₹ 1,300·00

Here, $P = ₹\ 1{,}300{\cdot}00,\ R = 5\%\ \text{p.a.},\ T = \frac{1}{12}\ \text{yr}$

$\therefore$ $\text{Interest (I)} = \frac{P \times R \times T}{100} = \frac{1{,}300 \times 5 \times 1}{100 \times 12} = \frac{65}{12} = ₹\ 5{\cdot}42$

Hence, 11^{th} entry in the passbook = ₹ 1,450 + 5·42 = ₹ 1,455·42.

Question 8. A page from the passbook of Mrs. Rama Bhalla is given below:
Calculate the interest due to Mrs. Bhalla for the period from January 2004 to December 2004, at the rate of 5% per annum.

Date Year 2004	Particulars	Amount (₹) Withdrawals	Amount (₹) Deposits	Balance (₹)
January 1	B/F	—	—	2,000.00
January 9	By cash	—	200.00	2,200.00
February 10	To cheque	500.00	—	1,700.00
February 24	By cheque	—	300.00	2,000.00
July 29	To cheque	200.00	—	1,800.00
November 7	By cash	—	300.00	2,100.00
December 8	By cash	—	200.00	2,300.00

Min Balance for

Jan.	2004	=	₹ 2,200
Feb.	2004	=	₹ 1,700
March	2004	=	₹ 2,000
April	2004	=	₹ 2,000
May	2004	=	₹ 2,000
June	2004	=	₹ 2,000
July	2004	=	₹ 1,800
Aug.	2004	=	₹ 1,800
Sep.	2004	=	₹ 1,800
Oct.	2004	=	₹ 1,800
Nov.	2004	=	₹ 2,100
Dec.	2004	=	₹ 2,300
		Total	₹ 23,500

₹ 23,500 is treated as principal of one month for cal. the interest.

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

$$= \frac{23{,}500 \times 1 \times 5}{12 \times 100}$$

$$= ₹\ 97{\cdot}92$$

Question 9. A page from the Savings Bank Account of Mr. Prateek is given below:

Date	Particulars	Withdrawals (in ₹)	Deposits (in ₹)	Balance (in ₹)
January 1st, 2006	B/F	—	—	1,270
January 7th, 2006	By Cheque	—	2,310	3,580
March 9th, 2006	To Self	2,000	—	1,580
March 26th, 2006	By Cash	—	6,200	7,780
June 10th, 2006	To Cheque	4,500	—	3,280
July 15th, 2006	By Clearing	—	2,630	5,910
October 18th, 2006	To Cheque	530	—	5,380
October 27th, 2006	To Self	2,690	—	2,690
November 3rd, 2006	By Cash	—	1,500	4,190
December 6th, 2006	To Cheque	950	—	3,240
December 23rd, 2006	By Transfer	—	2,920	6,160

If he receives ₹ 198 as interest on 1st January, 2007, find the rate of interest paid by the bank.

Solution :

Month		Qualifying amount (₹)
January	=	3,580
February	=	3,580
March	=	1,580
April	=	7,780
May	=	7,780
June	=	3,280
July	=	3,280
August	=	5,910
September	=	5,910
October	=	2,690
November	=	4,190
December	=	3,240
Total		52,800

$$\text{Interest} = \frac{52{,}800 \times R \times \frac{1}{12}}{100}$$

$$198 = \frac{528}{12} R$$

$$\Rightarrow \quad R = \frac{198 \times 12}{528} = 4{\cdot}5\%.$$

Question 10. Mr. S.K. Mishra had a Savings Bank Account in Punjab National Bank. His Passbook had the following entries:

Date	Particulars	Withdrawals (in ₹)	Deposits (in ₹)	Balance (in ₹)
1998, Jan. 8	By Cash	—	500·00	500·00
March 19	To Cheque No. 626	100·00	—	400·00
May 23	By Cheque	—	1,500·00	1,900·00
July 29	To Withdrawals Slip	200·00	—	1,700·00
Sept. 2	By Cash	—	1,300·00	3,000·00

If the interest is paid at the rate of 5% per annum at the end of September every year, calculate the amount he will get if he closes the account on October 30, of the same year.

Solution : As per entries of the Passbook page of Mrs. Mishra, we have :

Month	Minimum Balance between 10th day and the last day (in ₹)	Qualifying Amount for interest (in ₹)
Jan.	500	500 × 2 = 1,000
Feb.	500	
March	400	400 × 3 = 1,200
April	400	
May	400	
June	1,900	1,900
July	1,700	1,700 × 2 = 3,400
Aug.	1,700	
Sept.	3,000	3,000
Oct.	00	00
Total		₹ 10,500

∴ Principal for one month (*i.e.*, $\frac{1}{12}$ th of the year) = ₹ 10,500

Rate of interest = 5%.

$$\therefore \quad \text{Interest} = \frac{10{,}500 \times 5 \times \frac{1}{12}}{100} = ₹\ 43.75$$

The amount Mr. Mishra will get on closing the account on October 30 of the same year

= ₹ (3,000 + 43.75) = ₹ 3,043.75

Note : As the account is closed on October 30, no amount has been shown for this month for interest.

Question 11. The entries in the passbook of a Saving Bank Account holder are as follows:

Date	Particulars	Withdrawals (₹)	Deposits (₹)	Balance (₹)
Feb. 12, 1986	By cash	—	2,000·00	2,000·00
March 10	By cash	—	1,100·00	3,100·00
April 20	To cheque no. 231	800·00	—	2,300·00
April 25	By cash	—	700·00	3,000·00
May 11	To cheque no. 232	700·00	—	2,300·00
July 2	By cash	—	400·00	2,700·00
July 8	By cash	—	500·00	3,200·00
Aug. 10	By cash	—	600·00	3,800·00
Aug. 28	To cheque no. 233	200·00	—	3,600·00

Rate of interest is 5% per annum. Calculate the interest due if the account is closed on :

(i) September 29, 1986, (ii) October 1, 1986.

Solution :

Principal for the month of February	=	Nil
Principal for the month of March	=	₹ 3,100·00
Principal for the month of April	=	₹ 2,300·00
Principal for the month of May	=	₹ 2,300·00
Principal for the month of June	=	₹ 2,300·00
Principal for the month of July	=	₹ 3,200·00
Principal for the month of August	=	₹ 3,600·00
Total		₹ 16,800·00

(i) If the account is dosed on Sept 29, 1986, then month of Sept., will not earn interest and principal for one month Rs. 16,800.

$$\text{Rate} = 5\% \text{ p.a.}$$

$$\text{Interest} = ₹\left(\frac{16,800 \times 5}{100} \times \frac{1}{12}\right)$$

$$= ₹\frac{168 \times 5}{12}$$

$$= ₹ 14 \times 5$$

$$= ₹ 70$$

(ii) If the account is closed on Oct. 1, 1986

$$\text{Interest due for the month of September} = \frac{P \times R \times T}{100}$$

$$= ₹\left(\frac{3,600 \times 5}{100} \times \frac{1}{12}\right)$$

$$= ₹ 15$$

$$\therefore \quad \text{Interest due} = ₹ (70 + 15)$$

$$= ₹ 85$$

Question 12. Mrs. Kapoor opened a Savings Bank Account in State Bank of India on 9th January 2008. Her pass book entries for the year 2008 are given below:

Date	Particulars	Withdrawals (in ₹)	Deposits (in ₹)	Balance (in ₹)
Jan. 9, 2008	By Cash	—	10,000	10,000
Feb. 12, 2008	By Cash	—	15,500	25,500
April 6, 2008	To Cheque	3,500	—	22,000
April 30, 2008	To Self	2,000	—	20,000
July 16, 2008	By Cheque	—	6,500	26,500
August 4, 2008	To Self	5,500	—	21,000
August 20, 2008	To Cheque	1,200	—	19,800
Dec. 12, 2008	By Cash	—	1,700	21,500

Mrs. Kapoor closes the account on 31st December, 2008. If the bank pays interest at 4% per annum, find the interest Mrs. Kapoor receives on closing the account. Give your answer correct to the nearest rupee.

Solution :

Month	Minimum Balance (₹)
January	10,000
February	10,000
March	25,500
April	20,000
May	20,000
June	20,000
July	20,000
August	19,800
September	19,800
October	19,800
November	19,800
Total	₹ 2,04,700

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

$$= \frac{2,04,700 \times 1 \times 4}{100 \times 12} = ₹\ 682{\cdot}33 = ₹\ 682$$

Question 13. Mr. Ashok has an account in the Central Bank of India. The following entries are from his pass book:

Date	Particulars	Withdrawals (₹)	Deposits (₹)	Balance (₹)
01·01·05	B/F	—	—	1,200·00
07·01·05	By cash		500·00	1,700·00
17·01·05	To cheque	400·00	—	1,300·00
10·02·05	By cash	—	800·00	2,100·00
25·02·05	To cheque	500·00	—	1,600·00
20·09·05	By cash	—	700·00	2,300·00
21·11·05	To cheque	600·00	—	1,700·00
05·12·05	By cash	—	300·00	2,000·00

If Mr. Ashok gets Rs. 83.75 as interest at the end of the year where the interest is compounded annually, calculate the rate of interest paid by the bank in his Savings Bank Account on 31st December, 2005.

Solution :

Month	Minimum Balance between 10th day and last day (in ₹)	Qualifying Amount for Interest
January	1,300	1,300
February	1,600	1,600 × 8 = 12,800
March	1,600	
April	1,600	
May	1,600	
June	1,600	
July	1,600	
August	1,600	
September	1,600	
October	2,300	2,300
November	1,700	1,700
December	2,000	2,000
Total		₹ 20,100

Principal for 1 month = ₹ 20,100

Let x be Rate of Interest

then $$\text{Interest} = \frac{20{,}100 \times x \times 1}{100 \times 12}$$

$$\therefore \quad 83{\cdot}75 = \frac{20{,}100x}{1{,}200}$$

$$x = \frac{83{\cdot}75 \times 1{,}200}{20{,}100}$$

$$x = 5$$

$\therefore$ Rate = 5%

Question 14. Mr. Mishra has a Savings Bank Account in Allahabad Bank. His pass book entries are as follows:

Date	Particulars	Amount Withdrawals (₹)	Amount Deposits	Amount Balance (₹)
Jan. 4, 2007	By Cash	—	1,000·00	1,000·00
Jan. 11, 2007	By Cheque	—	3,000·00	4,000·00
Feb. 3, 2007	By Cash	—	2,500·00	6,500·00
Feb. 7, 2007	To Cheque	2,000·00	—	4,500·00
March 3, 2007	By Cash	—	5,000·00	9,500·00
May 25, 2007	By Cash	—	2,000·00	11,500·00
June 7, 2007	By Cash	—	3,500·00	15,000·00
Aug. 29, 2007	To Cheque	1,000·00	—	14,000·00

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.

Solution : Minimum Balance for

Jan.	=	₹ 1,000
Feb.	=	₹ 4,500
March	=	₹ 9,500
April	=	₹ 9,500
May	=	₹ 9,500
June	=	₹ 15,000
July	=	₹ 15,000
August	=	₹ 14,000
September	=	₹ 14,000
Total		₹ 92,000

₹ 92,000 is treated as principal of one month for calculating the interest

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

$$= \frac{92{,}000 \times 4{\cdot}5 \times \frac{1}{12}}{100}$$

$$= ₹\ 345$$

Question 15. A page from the saving bank account of Priyanka is given below:

Date	Particulars	Amount withdrawn (₹)	Amount deposited (₹)	Balance (₹)
3/4/2006	B/F			4,000·00
5/4/2006	By cash		2,000·00	6,000·00
18/4/2006	By cheque		6,000·00	12,000·00
25/5/2006	To cheque	5,000·00		7,000·00
30/5/2006	By cash		3,000·00	10,000·00
20/7/2006	By self	4,000·00		6,000·00
10/9/2006	By cash		2,000·00	8,000·00
19/9/2006	To cheque	1,000·00		7,000·00

If the interest earned by Priyanka for the period ending September, 2006 is Rs. 175, find the rate of interest.

Solution :

Principal for the month of April = ₹ 6,000
Principal for the month of May = ₹ 7,000
Principal for the month of June = ₹ 10,000
Principal for the month of July = ₹ 6,000
Principal for the month of August = ₹ 6,000
Principal for the month of September = ₹ 7,000
Total Principal for one month = ₹ 42,000

$P = ₹ 42,000,$

$R = r\%$ per annum, $T = \frac{1}{12}$

$I = ₹ 175$

Thus, $I = \frac{PRT}{100}$

$$175 = \frac{42,000 \times r}{100} \times \frac{1}{12}$$

$$r = \frac{175 \times 12}{420} = 5\%$$

Thus the required rate of interest is 5% per annum.

Question 16. Given the following details, calculate the simple interest at the rate of 6% per annum up to June, 30:

Date	Debit (in ₹)	Credit (in ₹)	Balance (in ₹)
January 1	—	24,000·000	24,000·00
January 20	5,000·00	—	19,000·00
January 29	—	10,000·00	29,000·00
March 15	—	8,000·00	37,000·00
April 3	—	7,653·00	44,653·00
May 6	3,040·00	—	41,613·00
May 8	—	5,087·00	46,700·00

Solution :

Minimum balance in January = ₹ 19,000·00
Minimum balance in February = ₹ 29,000·00
Minimum balance in March = ₹ 29,000·00
Minimum balance in April = ₹ 44,650·00
Minimum balance in May = ₹ 46,700·00
Minimum balance in June = ₹ 46,700·00
Total = 2,15,050·00

$\therefore$ Interest = $₹ \frac{2,15,050 \times 6}{100} \times \frac{1}{12}$

= ₹ 1,075·25 Ans.