ML Aggarwal Solutions for Class 10
Maths
Chapter 2: Banking

Exercise 2

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

Ans: Here, we have:

P = money deposited per month = ₹1000,

n = number of months for which the money is deposited $=3\times12=36$,

r = simple interest rate percent per annum = 8

Now,

Using the formula,

$$I=P\times\frac{n(n+1)}{2\times12}\times\frac{r}{100}$$

We get,

$$I=\left(1000\times\frac{36\times37}{2\times12}\times\frac{8}{100}\right)$$

$$=\left(1000\times\frac{1332}{24}\times\frac{8}{100}\right)$$

$$=(1000\times55.5\times0.08)$$

$$\Rightarrow I=4440$$

Using the formula:

$$MV=(P\times n)+I$$

We get

$$MV=(1000\times36)+4440$$

$$\Rightarrow 36000+4440$$

$$\Rightarrow 40440$$

Therefore, the matured amount = ₹40440.

2. Sonia had a recurring deposit account in a bank and deposited ₹600 per month for $2\frac{1}{2}$ years. If the rate of interest was 10% p.a., find the maturity value of this account.

Ans: Here, we have:

P = money deposited per month = ₹600,

n = number of months for which the money is deposited = 2 x 12 + 6 = 30,

r = simple interest rate percent per annum = 10

Using the formula:

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

We get,

$I = \left(600 \times \frac{30 \times 31}{2 \times 12} \times \frac{10}{10}\right)$

$= \left(600 \times \frac{930}{24} \times 0.1\right)$

$= (600 \times 38.75 \times 0.1)$

$\Rightarrow I = 2,325$

Using the formula:

$MV = (P \times n) + I$

we get

$MV = (600 \times 30) + 2325$

$\Rightarrow 18000 + 2325$

$\Rightarrow 20325$

Therefore, the maturity value of this account= ₹20325.

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

Ans: Here, we have:

P = money deposited per month = ₹200,

n = number of months for which the money is deposited = 36,

r = simple interest rate percent per annum = 11

Using the formula

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

$I = \left(200 \times \frac{36 \times 37}{2 \times 12} \times \frac{11}{100}\right)$

$I = \left(200 \times \frac{1332}{24} \times \frac{11}{100}\right)$

$= \left(200 \times 55.5 \times 0.11\right)$

$\Rightarrow I = 1221$

Using the formula: $MV = (P \times n) + I$

We get

$MV = (200 \times 36) + 1221$

$\Rightarrow 7200 + 1221$

$\Rightarrow MV = 8421$

Therefore, the maturity value of this account= ₹8421.

4. Haneef has a cumulative bank account and deposits ₹600 per month for a period of 4 years. If he gets ₹5880 as interest at the time of maturity, find the rate of interest per annum.

Ans: Here, we have:

P = money deposited per month = ₹600,

n = number of months for which the money is deposited $= 4 \times 12 = 48$

Let the rate of interest be r% per annum, then by using the formula

We get,

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

$$\Rightarrow I = (600 \times \frac{48 \times 49}{2 \times 12} \times \frac{r}{100})$$

$$\Rightarrow I = (600 \times 98 \times 0.01r)$$

$$\Rightarrow I = 588r$$

According to the given question,

$588r \Rightarrow 5880$

$$\Rightarrow r = \frac{5880}{588}$$

$$\Rightarrow r = 10$$

Therefore, the rate of interest per annum =10%

5. David opened a Recurring Deposit Account in a bank and deposited ₹300 per month for two years. If he received ₹7725 at the time of maturity, find the rate of interest.

Ans: Here, we have:

P = money deposited per month = ₹300,

n = number of months for which the money is deposited $= 2 \times 12 = 24$

Let the rate of interest be r% per annum, then by using the formula

We get,

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

$$I = (300 \times \frac{24 \times 25}{2 \times 12} \times \frac{r}{100})$$

$$I = (300 \times 25 \times 0.01r)$$

$$\Rightarrow I = 75r$$

Total money deposited by David = $P \times n$ = ₹ 300×24 = ₹7200

$= 7200 + 75r$

Therefore, the matured amount = total money deposited + interest

According to the given question,

$7200 + 75r = 7725$

$\Rightarrow 75r = 7725 - 7200$

$\Rightarrow r = \frac{525}{75}$

$\Rightarrow r = 7$

Therefore, the rate of interest = 7%

6. Mr. Gupta opened a recurring deposit account in a bank. He deposited ₹2500 per month for two years. At the time of maturity, he got ₹67500. Find:
A. The total interest earned by Mr. Gupta.

Ans: Here, we have:

P = money deposited per month = ₹2500,

n = number of months for which the money is deposited = 2 x 12 = 24

Therefore, total money deposited by Mr. Gupta

$= (2500 \times 24)$

$\Rightarrow$ **₹60000**

Money Mr. Gupta gets at the time of maturity = ₹67500

Therefore, the total interest earned by Mr. Gupta

$= 67500 - 60000$

$\Rightarrow$ **₹ 7500**

B. The rate of interest per annum.

Ans: Let the rate of interest be r% per annum, then by using the formula:

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

We get,

$7500 = (2500 \times \frac{24 \times 25}{2 \times 12} \times \frac{r}{100})$

$\Rightarrow 7500 = 625r$

$\Rightarrow r = \frac{7500}{625}$

$\Rightarrow r = 12$

Therefore, the rate of interest = 12%p.a.

7. Shahrukh opened a Recurring Deposit Account in a bank and deposited ₹800 per month for 1½ years. If he received ₹15084 at the time of maturity, find the rate of interest per annum.

Ans: Here, we have:

P = money deposited per month = ₹800,

n = number of months for which the money is deposited $=1\times12+6=18$

Let the rate of interest be r% per annum, then by using the formula:

$$I = P\times\frac{n(n+1)}{2\times12}\times\frac{r}{100}$$

We get,

$$I = (800\times\frac{18\times19}{2\times12}\times\frac{r}{100})$$

$$\Rightarrow I = 114r$$

Total money deposited by Shahrukh = ₹800 x 18 = ₹14400

Therefore, the matured amount = total money deposited + interest

$$=14400+114r$$

According to the given,

$$14400+114r=15084$$

$$\Rightarrow 114r=15084-14400$$

$$\Rightarrow 114r=684$$

$$\Rightarrow r=\frac{684}{114}$$

$$\Rightarrow r=6$$

Therefore, the rate of interest per annum = 6%

8. 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.

Ans: Here, we have:

n = number of months for which the money is deposited = 20,

r = interest rate per annum = 9

Let the monthly instalment be ₹x, then P = ₹x.

Using the formula:

$$I = P\times\frac{n(n+1)}{2\times12}\times\frac{r}{100}$$

We get,

$$I = (x\times\frac{20\times21}{2\times12}\times\frac{9}{100})$$

$$I = (x\times17.5\times0.09$$

$$\Rightarrow I = 1.575x$$

According to the given question,

$$1.575x=441$$

$\Rightarrow x = \frac{441}{1.575}$

$\Rightarrow x = 280$

Therefore, the amount of the monthly installment= ₹280

9. 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.

Ans: Here, we have:

n = number of months for which the money is deposited = 2 x 12 = 24,

r = interest rate per annum = 6

Let the monthly instalment be ₹x, then P = ₹x.

Using the formula:

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

We get,

$I = (x \times \frac{24 \times 25}{2 \times 12} \times \frac{6}{100})$

$\Rightarrow I = 1.5x$

According to the given question,

$1.5x = 1200$

$\Rightarrow x = \frac{1200}{1.5}$

$\Rightarrow x = 800$

Therefore, the monthly instalment = ₹800

B. The amount of maturity.

Ans: Total amount deposited by Mohan $= ?(800 \times 24) = ?19200$

Therefore, the amount of maturity = total amount deposited + interest

$= 19200 + 1200$

$\Rightarrow 20400$

Therefore, the matured amount = ₹20400

10. Mr. R.K. Nair gets ₹6455 at the end of one year at the rate of 14% per annum in a recurring deposit account. Find the monthly installment.

Ans: Here, we have:

n = number of months for which the money is deposited $= 1 \times 12 = 12$,

r = interest rate per annum = 14

Let the monthly installment be ₹x, then P = ₹x.

Using the formula:

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

We get,

$I = (x \times \frac{12 \times 13}{2 \times 12} \times \frac{14}{100})$

$\Rightarrow I = \frac{91}{100} x$

Total money deposited by Mr. R.K. Nair = ₹12x

Therefore, the amount of maturity = total money deposited + interest

$\Rightarrow 12x + \frac{91}{100} x$

$\Rightarrow \frac{1291}{100} x$

According to the given question,

Amount of maturity = ₹6455

$\Rightarrow \frac{1291}{100} x = 6455$

$\Rightarrow x = \frac{6455}{1291} \times 100$

$\Rightarrow x = 5 \times 100$

$\Rightarrow x = 500$

Therefore, the monthly installment = ₹500

11. Samita has a recurring deposit account in a bank of ₹2000 per month at the rate of 10% p.a. If she gets ₹83100 at the time of maturity, find the total time for which the account was held.

Ans: Deposit per month = Rs 2000 ,

Rate of interest $= 10\%$, Let period $= \text{n}$ months

$= 2000 \times \frac{n(n+1)}{2}$

$= 100n(n+1)$ and interest

$= \frac{1000n(n+1) \times 10 \times 1}{100 \times 12}$

$= \frac{100n(n+1)}{12}$

$\therefore$ Maturity value

$= 2000 \times n + \frac{100n(n+1)}{12}$

$\therefore 2000n + \frac{100n(n+1)}{12} = 83100$

$\Rightarrow 24000n+100n^2+100m=83100\times12$

$\Rightarrow 240n+n^2+n=831\times12$

$\Rightarrow n^2+241n-9972=0$

$\Rightarrow n^2+27n-36n-9972=0$

$\Rightarrow 2(n+277)-36(n+277)=0$

$\Rightarrow (n+277)(n-36)=0$

Either $n+277=0$, then $n=-277$, which is not possible.

or $n-36=0$, then $x=36$

$\therefore$ Period $=36$ months or 3years.

Multiple choice questions

1. If Sharukh opened a recurring deposit account in a bank and deposited ₹800 per month for 1½ years, then the total money deposited in the account is

A. ₹11400

B. ₹14400

C. ₹13680

D. none of these

Ans: Here, we have

P = money deposited per month = ₹800,

n = number of months for which the money is deposited $=1\times12+6=18$

Total money deposited by Shahrukh

$=800\times18$

$\Rightarrow$?14400

Therefore, the correct option is B.

2. Mrs. Asha Mehta deposit ₹250 per month for one year in a bank's recurring deposit account. If the rate of (simple) interest is 8% per annum, then the interest earned by her on this account is

A. ₹65

B. ₹120

C. ₹130

D. ₹260

Ans: Here, we have

P = money deposited per month = ₹250,

n = number of months for which the money is deposited $=1\times12=12$

r = simple interest rate percent per annum = 8

Using the formula:

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

We get,

$I = (250 \times \frac{12 \times 13}{2 \times 12} \times \frac{8}{100})$

$I = (250 \times 6.5 \times 0.08)$

$\Rightarrow I = 130$

Hence, Interest earned = ₹130

Therefore, the correct option is C.

3. Mr. Sharma deposited ₹500 every month in a cumulative deposit account for 2 years. If the bank pays interest at the rate of 7% per annum, then the amount he gets on maturity is

A. ₹875

B. ₹6875

C. ₹10875

D. ₹12875

Ans: Here, we have

P = money deposited per month = ₹500,

n = number of months for which the money is deposited = 2 x 12 = 24,

r = simple interest rate percent per annum = 7

Using the formula:

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

We get,

$I = (500 \times \frac{24 \times 25}{2 \times 12} \times \frac{7}{100})$

$500 \times 25 \times 0.07$

$\Rightarrow I = 875$

Using the formula:

$MV = (P \times n) + I$

We get

$MV = (500 \times 24) + 875$

$\Rightarrow MV = 12000 + 875$

$\Rightarrow MV = ?12875$

Therefore, the correct option is D.

Chapter Test

1. Mr. Dhruv deposits ₹600 per month in a recurring deposit account for 5 years at the rate of 10% per annum (simple interest). Find the amount he will receive at the time of maturity.

Ans: Here, we have

P = money deposited per month = ₹600,

n = number of months for which the money is deposited = 5 x 12 = 60,

r = simple interest rate percent per annum = 10

Using the formula,

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

We get,

$$I = (600 \times \frac{60 \times 61}{2 \times 12} \times \frac{10}{100})$$

$$I = 600 \times 152.5 \times 0.1$$

$$\Rightarrow 9150$$

Using the formula:

$$MV = (P \times n) + I$$

We get,

$$MV = (600 \times 60) + 9150$$

$$\Rightarrow MV = 36000 + 9150$$

$$\Rightarrow MV = 45150$$

Therefore, the total amount Mr. Dhruv will receive at the time of maturity = ₹45150

2. Ankita started paying ₹400 per month in 3 years recurring deposit. After six months her brother Anshul started paying ₹500 per month in a 2½ years recurring deposit. The bank paid 10% p.a. simple interest for both. At maturity who will get more money and by how much?

Ans: For Ankita,

P = money deposited per month = ₹400,

n = number of months for which the money is deposited = 3 x 12 = 36,

r = simple interest rate percent per annum = 10

Using the formula,

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

We get,

$$I = (400 \times \frac{36 \times 37}{2 \times 12} \times \frac{10}{100})$$

$$I = 400 \times 55.5 \times 0.1$$

$\Rightarrow I = 2220$

Using the formula:

$MV = (P \times n) + I$

We get,

$MV = (400 \times 36) + 2220$

$\Rightarrow MV = 14400 + 2220$

$\Rightarrow MV = 16620$

The matured amount Ankita will get = ₹16620.

For Anshul,

P = money deposited per month = ₹500,

n = number of months for which the money is deposited $= 2 \times 12 + 6 = 30$,

r = simple interest rate percent per annum = 10

Using the formula:

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

We get,

$I = (500 \times \frac{30 \times 31}{2 \times 12} \times \frac{10}{100})$

$\Rightarrow 1937.50$

Using the formula:

$MV = (P \times n) + I$

we get,

$MV = (500 \times 30) + 1937.50$

$\Rightarrow MV = 15000 + 1937.50$

$\Rightarrow MV = 16937.50$

Therefore, the matured amount Anshul will get = ₹16937.50.

At maturity Anshul will get more amount.

Difference in maturity amount

$= 16937.50 - 16620$

$\Rightarrow 317.50$

Hence, Anshul will get ₹317.50 more than Ankita at the time of maturity.

3. Shilpa has a 4-year recurring deposit account in Bank of Maharashtra and deposits ₹800 per month. If she gets ₹48200 at the time of maturity, find

A. The rate of (simple) interest,

Ans: Here, we have

P = money deposited per month = ₹800,

n = number of months for which the money is deposited = 4 x 12 = 48

Therefore,

Total money deposited by Shilpa = ₹(800×48) = ₹38400

Money Shilpa gets at the time of maturity = ₹48200

Hence, total interest earned by Shilpa

$=48200-38400$

$\Rightarrow 9800$

Let the rate of interest be r% per annum,

then by using the formula:

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

$$9800=(800\times\frac{48\times 49}{2\times 12}\times\frac{r}{100})$$

$$\Rightarrow 9800=784r$$

$$\Rightarrow r=\frac{9800}{784}$$

$$\Rightarrow r=12.5$$

B. The total interest earned by Shilpa

Ans: As calculated above,

Total interest earned by Shilpa

$=48200-38400$

$\Rightarrow 9800$

4. Mr. Chaturvedi has a recurring deposit account in Grindlay's Bank for 4½ years at 11% p.a. (simple interest). If he gets ₹101418.75 at the time of maturity, find the monthly installment.

Ans: Here,

n = number of months for which the money is deposited = 4 x 12 + 6 = 54,

r = interest rate per annum = 11

Let the monthly installment be ₹x, then P = ₹x.

Using the formula:

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

We get,

$$I=(x\times\frac{54\times 55}{2\times 12}\times\frac{11}{100})$$

$$\Rightarrow I=\frac{1089}{80}x$$

Total money deposited by Mr. Chaturvedi = ₹54x

Therefore, the matured amount = total money deposited + interest

$\Rightarrow 54x + \frac{1089}{80}x$

$\Rightarrow \frac{5409}{80}x$

According to the given question,

$\Rightarrow \frac{5409}{80}x = 101418.75$

$\Rightarrow \frac{5409}{80}x = \frac{10141875}{100}$

$\Rightarrow x = \frac{10141875 \times 80}{100 \times 5409}$

$\Rightarrow x = 1500$

Therefore, the monthly installment = ₹1500

5. Rajiv Bhardwaj has a recurring deposit account in a bank of ₹600 per month. If the bank pays simple interest of 7% p.a. and he gets ₹15450 as maturity amount, find the total time for which the account was held.

Ans: Here, we have

P = money deposited per month = ₹600

r = simple interest rate percent per annum = 7

Let the account be held for n months

Using the formula:

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

We get,

$I = (600 \times \frac{n(n+1)}{2 \times 12} \times \frac{7}{100})$

$\Rightarrow I = \frac{7n(n+1)}{4}$

Total money deposited by Rajiv Bhardwaj = $₹(600 \times n) = ?600n$

Therefore, the matured amount = total amount deposited + interest

$\Rightarrow 600n + \frac{7n(n+1)}{4}$

$\Rightarrow \frac{2400n + 7n(n+1)}{4}$

$\Rightarrow \frac{7n^2 + 2407n}{4}$

According to the question,

$\Rightarrow \frac{7n^2 + 2407n}{4} = 15450$

$\Rightarrow 7n^2 + 2407n - 61800 = 0$

$\Rightarrow 7n(n-24) + 2575(n-24) = 0$

$\Rightarrow (n-24)(7n+2575) = 0$

$\Rightarrow n = 24$ **, or** $n = -\frac{2575}{7}$

Since, n can't be negative.

$\Rightarrow n = 24$

Therefore, the total time for which the account was held = 24months (i.e., 2years)