

Book Name: Selina Concise

EXERCISE 2(A)**SOLUTION 1:**a) Balance on 3rd Sept. = Rs. 2,700Balance on 8th Sept. = Rs. 2,700 – Rs. 1,200 = Rs. 1,500Balance on 17th Sept. = Rs. 1,500 + Rs. 500 = Rs. 2,000

Then minimum balance for the month of Sept = Rs. 1,500 Ans

b) Balance on 7th Nov. = Rs. 750Balance on 30th Nov. = Rs. 750 – Rs. 200 = Rs. 550

Then minimum balance for the month of Nov. = Rs. 550 Ans.

SOLUTION 2:Balance on 22nd Feb. = Rs. 300Balance on 5th March = Rs. 300 + Rs. 1,500 = Rs. 1,800Balance on 12th April = Rs. 1,800 – Rs. 500 = Rs. 1,300

- (i) Minimum balance for the month of Feb. = Nil since he opens the account after 10th of the month.
- (ii) Minimum balance for the month of March = Rs. 1,800
- (iii) Minimum balance for the month of April = Rs. 1,300
- (iv) Minimum balance for the month of May = Rs. 1,300

SOLUTION 3:Since balance on 7th April = Rs. 5,800and balance on 24th April = Rs. 5,000

Then minimum balance for the month of April = Rs. 5,000 Ans.

Since balance on 10th May = Rs. 5,000Balance on 16th May = Rs. 7,000Balance on 29th May = Rs. 5,500

Then minimum balance for the month of May = Rs. 5,000 Ans.

SOLUTION 4:i. Balance on 7th March = Rs. 3,750 – Rs. 1,200 = Rs. 2,550Balance on 2nd April = Rs. 2,550 + Rs. 2,300 = Rs. 4,850Balance on 10th April = Rs. 4,850 + Rs. 820 = Rs. 5,670Balance on 6th Oct. = Rs. 5,670 – Rs. 950 = Rs. 4,720Balance on 8th Dec. = Rs. 4,720 + Rs. 1,700 = Rs. 6,420

- ii. Minimum balance for the month of Jan. = Rs. 3,750
Minimum balance for the month of Feb. = Rs. 3,750
Minimum balance for the month of Mar. = Rs. 2,550
Minimum balance for the month of Apr. = Rs. 5,670
Minimum balance for the month of May = Rs. 5,670
Minimum balance for the month of June = Rs. 5,670
Minimum balance for the month of July = Rs. 5,670
Minimum balance for the month of Aug. = Rs. 5,670
Minimum balance for the month of Sept. = Rs. 5,670
Minimum balance for the month of Oct. = Rs. 4,720
Minimum balance for the month of Nov. = Rs. 4,720
Minimum balance for the month of Dec. = Rs. 6,420
Total principal = Rs. 59,930

$$\text{Rate} = 5\% \text{ p.a. and Time} = \frac{1}{12} \text{ year} \therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{59,930 \times 5 \times 1}{100 \times 12} = \text{Rs. } 249.71 \quad \text{Ans}$$

SOLUTION 5:

Minimum balance for Jan. = Rs. 14,000
Minimum balance for Feb. = Rs. 20,500
Minimum balance for Mar. = Rs. 20,500
Minimum balance for Apr. = Rs. 20,000
Minimum balance for May = Rs. 21,500
Minimum balance for June = Rs. 23,000
Total principal = Rs. 1,19,500

Rate = 4% p.a. and Time = $\frac{1}{12}$ year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{1,19,500 \times 4 \times 1}{100 \times 12} = \text{Rs. } 398.33 \quad \text{Ans}$$

SOLUTION 6:

Minimum balance for Jan = Rs. 2,200
Minimum balance for Feb = Rs. 1,700
Minimum balance for Mar. = Rs. 2,000
Minimum balance for Apr. = Rs. 2,000
Minimum balance for May = Rs. 2,000
Minimum balance for June = Rs. 2,000
Minimum balance for July = Rs. 1,800
Minimum balance for Aug. = Rs. 1,800

Minimum balance for Sept. = Rs. 1,800

Minimum balance for Oct. = Rs. 1,800

Minimum balance for Nov. = Rs. 2,100

Minimum balance for Dec. = Rs. 2,300

Total principal = Rs. 23,500

Rate = 5% p.a. and Time = $\frac{1}{12}$ year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{23,500 \times 5 \times 1}{100 \times 12} = \text{Rs. } 97.92 \text{ Ans}$$

SOLUTION 7:

Balance on 2nd Jan = Rs. 250

Balance on 9th Jan. = Rs. 250 + Rs. 825 = Rs. 1,075

Balance on 13th Mar. = Rs. 1,075 – Rs. 325 = Rs. 750

Balance on 24th July = Rs. 750 + Rs. 1,237 = Rs. 1,987

Balance on 6th Oct. = Rs. 1,987 – Rs. 250 = Rs. 1,737

Balance on 22nd Dec. = Rs. 1,737 + Rs. 958 = Rs. 2,695

(i) Minimum balance for Jan. = Rs. 1,075

Minimum balance for Feb. = Rs. 1,075

Minimum balance for Mar. = Rs. 750

Minimum balance for Apr. = Rs. 750

Minimum balance for May = Rs. 750

Minimum balance for June = Rs. 750

Minimum balance for July = Rs. 750

Minimum balance for Aug. = Rs. 1,987

Minimum balance for Sept. = Rs. 1,987

Minimum balance for Oct. = Rs. 1,737

Minimum balance for Nov. = Rs. 1,737

Minimum balance for Dec. = Rs. 1,737

Total principal = Rs. 15,085

Rate = 6.5% p.a. and time = $\frac{1}{12}$ year.

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{15,085 \times 6.5 \times 1}{100 \times 12} = \text{Rs. } 81.71 \text{ Ans}$$

(ii) Minimum balance for Jan. = Rs. 1,080

Minimum balance for Feb. = Rs. 1,080

Minimum balance for Mar. = Rs. 750

Minimum balance for Apr. = Rs. 750

Minimum balance for May = Rs. 750

Minimum balance for June = Rs. 750

Minimum balance for July = Rs. 750

Minimum balance for Aug. = Rs. 1,990

Minimum balance for Sept. = Rs. 1,990

Minimum balance for Oct. = Rs. 1,740

Minimum balance for Nov. = Rs. 1,740

Minimum balance for Dec. = Rs. 1,740

Total principal = Rs. 15,110

Rate = 6.5%p.a. and time = $\frac{1}{12}$ year.

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{15,110 \times 6.5 \times 1}{100 \times 12} = \text{Rs. 81.84 Ans}$$

Solution 8:

Balance on 3.7.12 = Rs. 690

Balance on 15.7.12 = Rs. 690 + Rs. 1,153 = Rs. 1,843

Balance on 27.8.12 = Rs. 1,843 + Rs. 2,468 = Rs. 4,311

Balance on 30.8.12 = Rs. 4,311 – Rs. 946 = Rs. 3,365

Balance on 12.9.12 = Rs. 3,365 – Rs. 1,000 = Rs. 2,365

Balance on 20.11.12 = Rs. 2,365 + Rs. 3,000 = Rs. 5,365

Balance on 26.11.12 = Rs. 5,365 + Rs. 750 = Rs. 6,115

Balance on 28.11.12 = Rs. 6,115 – Rs. 1,570 = Rs. 4,545

(i)

Minimum balance for July = Rs. 690

Minimum balance for Aug. = Rs. 1,843

Minimum balance for Sept. = Rs. 2,365

Minimum balance for Oct. = Rs. 2,365

Minimum balance for Nov. = Rs. 2,365

Minimum balance for Dec. = Rs. 4,545

Minimum balance for Jan. = Rs. 0

Total principal = Rs. 14,173

Rate = 6%p.a. and time = $\frac{1}{12}$ year.

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{14,173 \times 6 \times 1}{100 \times 12} = \text{Rs. 70.87 Ans}$$

(ii)

Minimum balance for July = Rs. 690

Minimum balance for Aug. = Rs. 1,840

Minimum balance for Sept. = Rs. 2,370

Minimum balance for Oct.= Rs. 2,370

Minimum balance for Nov.= Rs. 2,370

Minimum balance for Dec.= Rs. 4,550

Minimum balance for Jan. = Rs. 0

Total principal = Rs. 14,190

Rate = 6%p.a. and time = $\frac{1}{12}$ year.

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{14,190 \times 6 \times 1}{100 \times 12} = \text{Rs. 70.95 Ans}$$

Solution 9:

Minimum balance for Feb. = Rs. 0

Minimum balance for Mar.= Rs. 1,235

Minimum balance for Apr. = Rs. 2,275

Minimum balance for May = Rs. 1,605

Minimum balance for June = Rs. 1,605

Minimum balance for July = Rs. 1,405

Total principal = Rs. 8,125

Rate = 5% p.a. and time = $\frac{1}{12}$ year.

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{8,125 \times 5 \times 1}{100 \times 12} = \text{Rs. 33.85 Ans}$$

Solution 10:

(i)

Balance on 3rd Jan. = Rs. 5,000

Balance on 13th Feb. = Rs. 5,000 – Rs. 500 = Rs. 4,500

Balance on 24th Mar. = Rs. 4,500 + Rs. 2,000 = Rs. 6,500

Minimum balance for January = Rs. 5,000

Minimum balance for February = Rs. 4,500

Minimum balance for March = Rs. 4,500

Total principal = Rs. 14,000

Rate of interest = 6% p.a. and Time = $\frac{1}{12}$ Year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{14,000 \times 6 \times 1}{100 \times 12} = \text{Rs. 70 Ans}$$

(ii)

Balance on 31st March = Rs. 6,500 + Rs. 70 = Rs. 6,570

Balance on 20th May = Rs. 6,570 + Rs. 800 = Rs. 7,370

Balance on 7th July = Rs. 7,370 – Rs. 1,400 = Rs. 5,970

Balance on 18th July = Rs. 5,970 + Rs. 1,600 = Rs. 7,570

Balance on 15th September = Rs. 7,065 – Rs. 3,200 = Rs. 4,370

Balance on 26th September = Rs. 4,370 + Rs. 2,350 = Rs. 6,720

Minimum balance for April = Rs. 6,570

Minimum balance for May = Rs. 6,570

Minimum balance for June = Rs. 7,370

Minimum balance for July = Rs. 5,970

Minimum balance for August = Rs. 7,570

Minimum balance for September = Rs. 4,370

Total principal = Rs. 38,420

Rate = 6% and Time = $\frac{1}{12}$ Year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{38,420 \times 6 \times 1}{100 \times 12} = \text{Rs. } 192.10 \text{ Ans}$$

Balance on 1st October = Rs. 6,720 + Rs. 192.1 = Rs. 6,912.10

Since he closes his account on 20th October, then he will not receive any interest in this month.

So he will get Rs. 6,912.10

Solution 11:

Principle for the month of Jan = Rs. 3,580

Principle for the month of Feb = Rs. 3,580

Principle for the month of March = Rs. 1,580

Principle for the month of April = Rs. 7,780

Principle for the month of May = Rs. 7,780

Principle for the month of June = Rs. 3,280

Principle for the month of July = Rs. 3,280

Principle for the month of Aug = Rs. 5,910

Principle for the month of Sept = Rs. 5,910

Principle for the month of Oct = Rs. 2,690

Principle for the month of Nov = Rs. 4,190

Principle for the month of Dec = Rs. 3,240

Total Equivalent principle for 1 month = Rs. 52,800

$$\therefore \text{Rate}\% = \frac{I \times 100}{P \times T} \% = \frac{198 \times 100 \times 12}{52,800 \times 1} \% = 4.5\%$$

Solution 12:

Minimum balance for May = Rs. 3,700

Minimum balance for June = Rs. 4,150

Total principal = Rs. 7,850

Interest = Rs. 39.25 and time = $\frac{1}{12}$ year.

Solution 13:

Balance on 1st January = Rs. 7,500

Balance on 7th March = Rs. 7,500 + Rs. 1,875 = Rs. 9,375

Balance on 10th March = Rs. 9,375 + Rs. 625 = Rs. 10,000

Balance on 17th July = Rs. 10,000 – Rs. 3,250 = Rs. 6,750

Balance on 5th October = Rs. 6,750 + Rs. 2,160 = Rs. 8,910

Balance on 19th December = Rs. 8,910 – Rs. 1,340 = Rs. 7,570

Minimum balance for January = Rs. 7,500

Minimum balance for February = Rs. 7,500

Minimum balance for March = Rs. 10,000

Minimum balance for April = Rs. 10,000

Minimum balance for May = Rs. 10,000

Minimum balance for June = Rs. 10,000

Minimum balance for July = Rs. 6,750

Minimum balance for August = Rs. 6,750

Minimum balance for September = Rs. 6,750

Minimum balance for October = Rs. 8,910

Minimum balance for November = Rs. 8,910

Minimum balance for December = Rs. 7,570

Total principal = Rs. 1,00,640

Interest = Rs. 377.40 and Time = $\frac{1}{12}$ year

$$\therefore \text{Rate} = \frac{I \times 100}{P \times T} \% = \frac{377.40 \times 100}{1,00,640 \times \frac{1}{12}} = 4.5\% \text{ Ans}$$

$$\therefore \text{Rate} = \frac{I \times 100}{P \times T} \% = \frac{39.25 \times 100}{7,850 \times \frac{1}{12}} = 6\% \text{ Ans.}$$

Solution 14:

Balance on 5-4-2007 = Rs. 8,500

Balance on 15-5-2007 = Rs. 8,500 + Rs. 3,700 = Rs. 12,200

Balance on 27-7-2007 = Rs. 12,200 – Rs. 2,400 = Rs. 9,800

Balance on 6-9-2007 = Rs. 9,800 – Rs. 1,600 = Rs. 8,200

Balance on 18-12-2007 = Rs. 8,200 + Rs. 4,500 = Rs. 12,700

Balance on 29-1-2008 = Rs. 12,700 + Rs. 1,900 = Rs. 14,600

Balance on 23-3-2008 = Rs. 14,600

Minimum balance for April = Rs. 8,500

Minimum balance for May = Rs. 8,500

Minimum balance for June = Rs. 12,200

Minimum balance for July = Rs. 9,800

Minimum balance for August = Rs. 9,800

Minimum balance for September = Rs. 8,200

Minimum balance for October = Rs. 8,200

Minimum balance for November = Rs. 8,200

Minimum balance for December = Rs. 8,200

Minimum balance for January = Rs. 12,700

Minimum balance for February = Rs. 14,600

Minimum balance for March = Rs. 0

Total principal = Rs. 1,08,900

Rate = 6%p.a. and Time = $\frac{1}{12}$ year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{1,08,900 \times 6 \times 1}{100 \times 12} = \text{Rs. } 544.50$$

The amount that he gets on closing the account

= Rs. 14,600 + Rs. 544.50

= Rs. 15,144.50 Ans.

Solution 15:

Balance on 01-01-2007 = Rs. 8,764

Balance on 13-03-2007 = Rs. 8,764 + Rs. 6,482 = Rs. 15,246

Balance on 22-06-2007 = Rs. 15,246 – Rs. 4,369 = Rs. 10,877

Balance on 09-08-2007 = Rs. 10,877 – Rs. 1,333 = Rs. 9,544

Balance on 24-11-2007 = Rs. 9,544 + Rs. 2,158 = Rs. 11,702

Minimum balance for January = Rs. 8,760

Minimum balance for February = Rs. 8,760

Minimum balance for March = Rs. 8,760

Minimum balance for April = Rs. 15,250

Minimum balance for May = Rs. 15,250

Minimum balance for June = Rs. 10,880

Minimum balance for July = Rs. 10,880

Minimum balance for August = Rs. 9,540

Minimum balance for September = Rs. 9,540

Minimum balance for October = Rs. 9,540

Minimum balance for November = Rs. 9,540

Minimum balance for December = Rs. 11,700

Total principal = Rs. 1,28,400

Rate = 5% p.a. and Time = $\frac{1}{12}$ Year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{1,28,400 \times 5 \times 1}{100 \times 12} = \text{Rs. 535 Ans}$$

Solution 16:

Minimum balance for January = Rs. 10,000

Minimum balance for February = Rs. 10,000

Minimum balance for March = Rs. 25,500

Minimum balance for April = Rs. 20,000

Minimum balance for May = Rs. 20,000

Minimum balance for June = Rs. 20,000

Minimum balance for July = Rs. 20,000

Minimum balance for August = Rs. 19,800

Minimum balance for September = Rs. 19,800

Minimum balance for October = Rs. 19,800

Minimum balance for November = Rs. 19,800

Minimum balance for December = Rs. 0

Total principal = Rs. 2,04,700

Rate = 4% p.a. and Time = $\frac{1}{12}$ Year

$$\therefore \text{Interest} = \frac{P \times R \times T}{100} = \frac{2,04,700 \times 4 \times 1}{100 \times 12} = \text{Rs. 682 Ans}$$

EXERCISE 2(B)

Solution 1:

Instalment per month (P) = Rs. 600

Number of months (n) = 20

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 600 \times \frac{20(20+1)}{2 \times 12} \times \frac{10}{100} \\ &= 600 \times \frac{420}{24} \times \frac{10}{100} = \text{Rs. 1,050}\end{aligned}$$

The amount that Manish will get at the time of maturity

$$= \text{Rs. } (600 \times 20) + \text{Rs. 1,050}$$

$$= \text{Rs. } 12,000 + \text{Rs. } 1,050$$

$$= \text{Rs. } 13,050 \text{ Ans}$$

Solution 2:

Instalment per month (P) = Rs. 640

Number of months (n) = 54

Rate of interest (r) = 12% p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 640 \times \frac{54(54+1)}{2 \times 12} \times \frac{12}{100} \\ &= 640 \times \frac{2970}{24} \times \frac{12}{100} = \text{Rs. } 9,504\end{aligned}$$

The amount that Manish will get at the time of maturity

$$= \text{Rs. } (640 \times 54) + \text{Rs. } 9,504$$

$$= \text{Rs. } 34,560 + \text{Rs. } 9,504$$

$$= \text{Rs. } 44,064 \text{ Ans.}$$

Solution 3:

For A

Instalment per month (P) = Rs. 1,200

Number of months (n) = 36

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 1,200 \times \frac{36(36+1)}{2 \times 12} \times \frac{10}{100} \\ &= 1,200 \times \frac{1332}{24} \times \frac{10}{100} = \text{Rs. } 6,660\end{aligned}$$

The amount that A will get at the time of maturity

$$= \text{Rs. } (1,200 \times 36) + \text{Rs. } 6,660$$

$$= \text{Rs. } 43,200 + \text{Rs. } 6,660$$

$$= \text{Rs. } 49,860$$

For B

Instalment per month (P) = Rs. 1,500

Number of months (n) = 30

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 1,500 \times \frac{30(30+1)}{2 \times 12} \times \frac{10}{100}\end{aligned}$$

$$= 1,500 \times \frac{930}{24} \times \frac{10}{100} = \text{Rs. } 5,812.50$$

The amount that B will get at the time of maturity

$$= \text{Rs. } (1,500 \times 30) + \text{Rs. } 5,812.50$$

$$= \text{Rs. } 45,000 + \text{Rs. } 5,812.50$$

$$= \text{Rs. } 50,812.50$$

$$\text{Difference between both amounts} = \text{Rs. } 50,812.50 - \text{Rs. } 49,860$$

$$= \text{Rs. } 952.50$$

Then B will get more money than A by Rs. 952.50 Ans

Solution 4:

Let Instalment per month (P) = Rs. y

Number of months (n) = 12

Rate of interest (r) = 11% p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= y \times \frac{12(12+1)}{2 \times 12} \times \frac{11}{100} \\ &= y \times \frac{156}{24} \times \frac{11}{100} = \text{Rs. } 0.715 y\end{aligned}$$

$$\text{Maturity value} = \text{Rs. } (y \times 12) + \text{Rs. } 0.715y = \text{Rs. } 12.715y$$

$$\text{Given maturity value} = \text{Rs. } 12,715$$

$$\text{Then Rs. } 12.715y = \text{Rs. } 12,715$$

$$\Rightarrow y = \frac{12,715}{12.715} = \text{Rs. } 1,000 \text{ Ans}$$

Solution 5:

$$\text{Maturity value} = \text{Rs. } (y \times 12) + \text{Rs. } 0.715y = \text{Rs. } 12.715y$$

$$\text{Given maturity value} = \text{Rs. } 12,715$$

$$\text{Then Rs. } 12.715y = \text{Rs. } 12,715$$

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= y \times \frac{42(42+1)}{2 \times 12} \times \frac{12}{100} \\ &= y \times \frac{1806}{24} \times \frac{12}{100} = \text{Rs. } 9.03 y\end{aligned}$$

$$\text{Maturity value} = \text{Rs. } (y \times 42) + \text{Rs. } 9.03y = \text{Rs. } 51.03 y$$

$$\text{Given maturity value} = \text{Rs. } 10,206$$

$$\text{Then Rs. } 51.03y = \text{Rs. } 10,206$$

$$\Rightarrow y = \frac{10,206}{51.03} = \text{Rs. } 200 \text{ Ans.}$$

Solution 6:

(a) Instalment per month (P) = Rs. 140

Number of months (n) = 48

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 140 \times \frac{48(48+1)}{2 \times 12} \times \frac{r}{100} \\ &= 140 \times \frac{2352}{24} \times \frac{r}{100} = \text{Rs. } (137.20)r\end{aligned}$$

Maturity value = Rs (140 × 48) + Rs. (137.20) r

Given maturity value = Rs 8,092

Then Rs (140 × 48) + Rs. (137.20) r = Rs. 8,092

137.20 r = Rs. 8,092 – Rs. 6,720

$$\Rightarrow r = \frac{1,372}{137.20} = 10\% \text{ Ans.}$$

(b) Instalment per month (P) = Rs. 300

Number of months (n) = 24

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 300 \times \frac{24(24+1)}{2 \times 12} \times \frac{r}{100} \\ &= 300 \times \frac{600}{24} \times \frac{r}{100} = \text{Rs. } (75)r\end{aligned}$$

Maturity value = Rs. (300 × 24) + Rs. (75) r

Given maturity value = Rs. 7,725

Then Rs. (300 × 24) + Rs. (75) r = Rs. 7,725

$\Rightarrow 75 r = \text{Rs. } 7,725 - \text{Rs. } 7,200$

$$\Rightarrow r = \frac{525}{75} = 7\% \text{ Ans}$$

Solution 7:

Instalment per month (P) = Rs. 150

Number of months (n) = 8

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 150 \times \frac{8(8+1)}{2 \times 12} \times \frac{8}{100} \\ &= 150 \times \frac{72}{24} \times \frac{8}{100} = \text{Rs. } 36\end{aligned}$$

The amount that Manish will get at the time of maturity

= Rs (150 × 8) + Rs. 36

= Rs. 1,200 + Rs. 36

= Rs. 1,236 Ans

Solution 8:

Instalment per month (P) = Rs. 350

Number of months (n) = 15

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 350 \times \frac{15(15+1)}{2 \times 12} \times \frac{r}{100} \\ &= 350 \times \frac{240}{24} \times \frac{r}{100} = \text{Rs. } (35)r\end{aligned}$$

Maturity value = Rs. $(350 \times 15) + \text{Rs. } (35)r$

Given maturity value = Rs. 5,565

Then Rs $(350 \times 15) + \text{Rs. } (35)r = \text{Rs. } 5,565$

$$\Rightarrow 35r = \text{Rs. } 5,565 - \text{Rs. } 5,250$$

$$\Rightarrow r = \frac{315}{35} = 9 \% \text{ Ans.}$$

Solution 9:

Instalment per month (P) = Rs. 1,200

Number of months (n) = n

Let rate of interest (r) = 8 %p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 1,200 \times \frac{n(n+1)}{2 \times 12} \times \frac{8}{100} \\ &= 1,200 \times \frac{n(n+1)}{24} \times \frac{8}{100} = \text{Rs. } 4n(n+1)\end{aligned}$$

Maturity value = Rs $(1,200 \times n) + \text{Rs. } 4n(n+1) = \text{Rs } (1200n + 4n^2 + 4n)$

Given maturity value = Rs. 12,440

Then $1200n + 4n^2 + 4n = 12,440$

$$\Rightarrow 4n^2 + 1204n - 12440 = 0$$

$$\Rightarrow n^2 + 301n - 3110 = 0$$

$$\Rightarrow (n + 311)(n - 10) = 0$$

$$\Rightarrow n = -311 \text{ Or } n = 10 \text{ months}$$

Then number of months = 10 Ans

Solution 10:

Instalment per month (P) = Rs. 300

Number of months (n) = n

Let rate of interest (r) = 12 % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 300 \times \frac{n(n+1)}{2 \times 12} \times \frac{12}{100} \\ &= 300 \times \frac{n(n+1)}{24} \times \frac{12}{100} = \text{Rs. } 1.5n(n+1)\end{aligned}$$

Maturity value = Rs (300 × n) + Rs. 1.5n (n + 1)

= Rs. (300n + 1.5n² + 1.5n)

Given maturity value = Rs. 8,100

Then 300n + 1.5n² + 1.5n = 8,100

$$\Rightarrow 1.5n^2 + 301.5n - 8100 = 0$$

$$\Rightarrow n^2 + 201n - 5400 = 0$$

$$\Rightarrow (n + 225)(n - 24) = 0$$

$$\Rightarrow n = -225 \text{ Or } n = 24 \text{ months}$$

Then time = 2 year

Solution 11:

(i) Maturity value = Rs. 67,500

Money deposited = Rs. 2,500 × 24 = Rs. 60,000

Then total interest earned = Rs. 67,500 – Rs. 60,000 = Rs. 7,500 Ans.

(ii) Instalment per month (P) = Rs. 2,500

Number of months (n) = 24

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 2500 \times \frac{24(24+1)}{2 \times 12} \times \frac{r}{100} \\ &= 2500 \times \frac{600}{24} \times \frac{r}{100} = \text{Rs. } (625)r\end{aligned}$$

Then 625r = 7500

$$\Rightarrow r = \frac{7500}{625} = 12\% \text{ Ans.}$$

EXERCISE 2(C)**Solution 1:**

Principal for the month February = 4500

Principal for the month March = 4500

Principal for the month April = 4500

Principal for the month May = 6730

Principal for the month June = 1730

Principal for the month July = 7730

Total principal for 1 month = Rs. 29,690

$$\therefore \text{Interest} = \frac{29690 \times 6}{100 \times 12} = \text{Rs. } 148.45 \text{ Ans}$$

Solution 2:

Minimum balance for August = Rs. 10,000

Minimum balance for September = Rs. 15,000

Minimum balance for October = Rs. 20,000

Minimum balance for November = Rs. 15,000

Minimum balance for December = Rs. 18,000

Minimum balance for January = Rs. 0

Total principal = Rs. 78,000

Rate = 5% p.a. and time = $\frac{1}{12}$ Year

$$\therefore \text{S.I.} = \frac{P \times R \times T}{100} = \text{Rs. } \frac{78,000 \times 5 \times 1}{100 \times 12} = \text{Rs. } 325$$

Then Amount received = Rs. 18,000 + Rs. 325 = Rs. 18,325 Ans

Solution 3:

Minimum balance for January = Rs. 15,600

Minimum balance for February = Rs. 5,100

Minimum balance for March = Rs. 5,100

Minimum balance for April = Rs. 5,100

Minimum balance for May = Rs. 5,100

Minimum balance for June = Rs. 11,400

Minimum balance for July = Rs. 9,000

Minimum balance for August = Rs. 9,000

Minimum balance for September = Rs. 9,000

Minimum balance for October = Rs. 0

Total principal = Rs. 74,400

Received interest = Rs. 310 and time = $\frac{1}{12}$ Year

$$\therefore \text{Rate} = \frac{I \times 100}{P \times T} = \text{Rs.} \frac{310 \times 100}{74,400 \times \frac{1}{12}} = 5\% \text{ Ans.}$$

Solution 4:

Instalment per month (P) = Rs. 600

Number of months (n) = 48

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 600 \times \frac{48(48+1)}{2 \times 12} \times \frac{8}{100} \\ &= 600 \times \frac{2352}{24} \times \frac{8}{100} = \text{Rs. } 4,704\end{aligned}$$

The amount that Manish will get at the time of maturity

$$= \text{Rs. } (600 \times 48) + \text{Rs. } 4,704$$

$$= \text{Rs. } 28,800 + \text{Rs. } 4,704$$

$$= \text{Rs. } 33,504 \text{ Ans}$$

Solution 5:

Installment per month (P) = Rs. 80

Number of months (n) = 18

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 80 \times \frac{18(18+1)}{2 \times 12} \times \frac{r}{100} \\ &= 80 \times \frac{342}{24} \times \frac{r}{100} = \text{Rs. } (11.4r)\end{aligned}$$

Maturity value = Rs (80 × 18) + Rs (11.4r)

Given maturity value = Rs. 1,554

Then Rs (80 × 18) + Rs (11.4 r) = Rs. 1,554

$$\Rightarrow 11.4 r = \text{Rs. } 1,554 - \text{Rs. } 1,440$$

$$\Rightarrow r = \frac{114}{11.4} = 10\% \text{ Ans}$$

Solution 6:

Installment per month (P) = Rs. 400

Number of months (n) = n

Let rate of interest (r) = 8 % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 400 \times \frac{n(n+1)}{2 \times 12} \times \frac{8}{100} \\ &= 400 \times \frac{n(n+1)}{24} \times \frac{8}{100} = \text{Rs. } \frac{4n(n+1)}{3}\end{aligned}$$

Given maturity value = Rs. 16,176

Then Rs. $(400 \times n) + \text{Rs. } \frac{4n(n+1)}{3} = \text{Rs. } 16,176$

$$\Rightarrow 1200n + 4n^2 + 4n = \text{Rs. } 48,528$$

$$\Rightarrow 4n^2 + 1204n = \text{Rs. } 48,528$$

$$\Rightarrow n^2 + 301n - 12132 = 0$$

$$\Rightarrow (n+337)(n-36) = 0$$

$$\Rightarrow n = -337 \text{ or } n = 36$$

Then number of months = 36 months = 3 years Ans

Solution 7:

Let installment per month = Rs. P

Number of months (n) = 24

Rate of interest $\hat{A}\text{\textcircled{R}} = 8\% \text{ p.a.}$

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= P \times \frac{24(24+1)}{2 \times 12} \times \frac{8}{100} \\ &= P \times \frac{600}{24} \times \frac{8}{100} = \text{Rs. } (2)P\end{aligned}$$

Maturity value = Rs. $(P \times 24) + \text{Rs. } 2P = \text{Rs. } 26P$

Given maturity value = Rs. 30,000

Then $26P = \text{Rs. } 30,000$

$$\Rightarrow P = \text{Rs. } \frac{30,000}{26} = \text{Rs. } 1153.84 = \text{Rs. } 1155 \text{ (multiple of 5) Ans.}$$

Solution 8:

(i) Let Installment per month = Rs. P

Number of months (n) = 36

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

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= P \times \frac{36(36+1)}{2 \times 12} \times \frac{8}{100} \\ &= P \times \frac{1332}{24} \times \frac{8}{100} = \text{Rs. } (4.44)P\end{aligned}$$

Given interest = Rs. 9,990

Then $4.44P = \text{Rs. } 9,990$

$$\Rightarrow P = \text{Rs. } \frac{9,990}{4.44} = \text{Rs. } 2,250 \text{ Ans.}$$

(ii) Maturity value = Rs $(2,250 \times 36) + \text{Rs. } 9,990 = \text{Rs. } 90,990$ Ans

Solution 9:

Installment per month (P) = Rs. 900

Number of months (n) = 48

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 900 \times \frac{48(48+1)}{2 \times 12} \times \frac{r}{100} \\ &= 900 \times \frac{2352}{24} \times \frac{r}{100} = \text{Rs. } (882)r\end{aligned}$$

Maturity value = Rs $(900 \times 48) + \text{Rs } (882)r$

Given maturity value = Rs. 52,020

Then Rs $(900 \times 48) + \text{Rs } (882) r = \text{Rs. } 52,020$

$$\Rightarrow 882 r = \text{Rs. } 52,020 - \text{Rs. } 43,200$$

$$\Rightarrow r = \frac{8820}{882} = 10\% \text{ Ans}$$

Solution 10:

Installment per month (P) = Rs. 1,800

Number of months (n) = 48

Let rate of interest (r) = r % p.a.

$$\begin{aligned}\therefore \text{S.I.} &= P \times \frac{n(n+1)}{2 \times 12} \times \frac{r}{100} \\ &= 1,800 \times \frac{48(48+1)}{2 \times 12} \times \frac{r}{100} \\ &= 1,800 \times \frac{2352}{24} \times \frac{r}{100} = \text{Rs. } (1,764)r\end{aligned}$$

Maturity value = Rs (1,800 × 48) + Rs (1,764)r

Given maturity value = Rs. 1,08,450

Then Rs (1,800 × 48) + Rs (1,764) r = Rs. 1,08,450

$$1764 r = \text{Rs. } 1,08,450 - \text{Rs. } 86,400$$

$$\Rightarrow r = \frac{22,050}{1,764} = 12.5\% \text{ Ans}$$

Solution 11:

Month	Balance (in Rs)
Apr 2007	7350
May	11900
Jun	11900
Jul	13400
Aug	13400
Sep	14400
Oct	14400
Nov	15200
Dec	15200
Jan 2008	13200
Feb	13200
Mar	14150
Total	157800

∴ Principal for 1 month is Rs. 157700, and Rate = 5% p.a.

$$\begin{aligned}\therefore \text{Interest} &= \frac{PRT}{100} = \frac{157700 \times 5 \times 1}{100 \times 12} = \frac{263 \times 55}{2} \\ &= \frac{1315}{2} = 657.08 = 657 \text{ (in rupees)}\end{aligned}$$

The interest paid on 1st April, 2008 is Rs. 657.

Solution 12:

Here, n = the number of months for which the money is deposited
 $= 3 \times 12 = 36$ and

r = interest rate percent per annum = 8

Let the monthly instalment be Rs. X then $P = \text{Rs. } X$

Using the formula:

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

$$I = \text{Rs. } x \times \frac{36 \times 37}{2 \times 12} \times \frac{8}{100} = \text{Rs. } \frac{111}{25} x$$

Total money deposited by Mr. Britto = $\text{Rs. } (x \times 36) = \text{Rs. } 36x$

The amount of maturity = Total money deposited + interest

$$= \text{Rs. } 36x + \text{Rs. } \frac{111}{25} x = \text{Rs. } \frac{1011}{25} x$$

But the amount of maturity = Rs. 8088 (given)

$$\Rightarrow \text{Rs. } \frac{1011}{25} x = 8088 \Rightarrow \frac{x}{25} = 8 \Rightarrow x = 200$$

Hence, the monthly instalment = Rs. 200