Exercise 4.1

1. Convert 250 US Dollar into Sterling Pound.

Solution:

Rate of US Dollar = Rs. 83.800

250 dollar = 250×83.800

= Rs. 20,950

Rate of pound sterling = Rs. 129.7968

Pounds of sterling in exchange of 250 dollars $= \frac{20950}{129.7968}$

= 161.406 Pounds

2. Convert 5000 Riyals into Pak Rupee.

Solution:

Rate of Saudi Riyal = Rs. 22.3449

Amount of Saudi Riyal = 5000

5000 Saudi Riyals in exchange of Pakistani rupees = 5000×22.3449

= Rs. 111724.5

3. An importer inports a car from Japan for 5000Yen delivery was to be made after three months. At the time of contract Re1 = 0.895236Yen. At the time of delivery Re.1=0892236 Yen. Payment was made at the time of contract. Determinie the profit or loss of the importer.

Solution:

Rate of import car in yen = 5000 yen

The value of Re. 1 atcontract time = 0.895236 yen

0.895236 Yen = 1 rupee

5000 Yen = 5000×0.895236

= Rs. 4476.18

The value of Re. 1 at delivery time = 0.892236

5000 Yen = 5000 × 0.892236

= Rs. 4461.18

Loss = 4476.18-4461.18

= Rs. 15

4. ***A customer wants to convert 150 American dollers into rupees. He goes; to an authorised dealer. He offers him conversion at the rate of 1 doller = Rs. 84.100. If it is converted with a money changer, the rate is 1 dollers = Rs. 83.4495, determine the amount into rupees if it is converted with:***

(i) Authorised dealer

(ii) Money Changer

(iii) The loss due to conversion with the money changer.

Solution:-

Number of American dollar = 150

Money exchanger with an authorised dealer

1 US dollar = Rs. 84.100

150 US dollar = 150×84.100

Rs. 12615

Rate of exchange with money changer

1 US dollar = Rs. 83.4495

Therefore 150 US dollar = 150×83.4495

= Rs. 12517.43

The loss due to conversion = 12615-12517.43

with the money changer

= Rs. 97.57

5. ***Rate of tea in Pakistan is Rs. 2.1 per pound. Distribute the rate per kilogram.***

(i) 1 pound = 2.2 kilogram

(ii) What will be the rate in Saudi Arbia if Saudi Riyal = Rs. 22.400.

Solution:

One pound = .45 kg

Rate of 1 pound tea = Rs. 19.089

Rate of .45 kg tea = Rs. 19.089

$$\text{Rate of 1 kg tea} = \frac{19.089}{.45}$$

= Rs. 42.42

1 Saudi Riyal = Rs. 22.40

$$\frac{1}{22.40} \times 42.42 = \text{Rs. } 42.42$$

= 1.90 Riyal per pound

6. ***An exporter of carpets exports to England Carpets amounting to 40000 Sterling Pound. The spot buying rate exchange at that time was Rs. 129.4542 to 1 Sterling. He receives the amount at the time when rate is Rs. 129.0599 to 1 Sterling. How much he looses?***

Solution:

Export price of a carpet = 4000 pound sterling

On contract time exchange of Rate.

1 pound sterling = Rs. 129.4542

4000 pound sterling = 4000×129.4542

= Rs. 517816.8

Exchange of Rate after time.

1 pound sterling = Rs. 129.0599

4000 pound sterling = 4000×129.0599

= Rs. 516239.6

Loss = 517816.8 - 516239.6

= Rs. 1577.2

7. ***A Pakistani living in Saudi Arabia earns 4370 Riyals a month. His monthly expenses comes to 3450 Riyals. He remits his saving monthly to Pakistan. How much he saved in a year if rate of exchange is Rs. 22.400 = 1 Saudi Riyals. After a year Rate of exchange is Rs. 22.3004. Determine the loss due to***

monthly remitance.

Rate of exchange

(1 Saudi Riyal) = Rs. 22.400

After one year

(1 Saudi Riyal) = Rs. 22.3004

Rate of exchange.

Solution:

Monthly income = 4370 Riyals

Monthly expenses = 3450 Riyals

Monthly saving = 4370 - 3450

= 920 Riyals

Annually saving = 12×920

Annually saving = 11040 Riyals

Rate of exhange

1 Riyal = Rs. 22.400

Therefore 11040 Riyals = 11040×22.400

= Rs. 247296

Rate of exchange after one year.

1 Riyal = Rs. 22.3004

Therefore 11040 Riyals = 11040×22.3004

= 246196.416

Loss = 247296 - 246196.42

= Rs. 1099.58

Monthly Less = 920 (22.400 - 22.3004)

= $920 \times .0996$

= 91.632

= Rs. 92

8. ***Rizwan purchases a car in Saudi Arabia for 15000 Riyals. Delivery was to be made after three months and payment is also to be made at the time of delivery. At the time of contract, the rate was 1 Riyal = Rs. 22.400, while at the time of delivery the rate was 1 Riyal Rs. 22.0827. Determine the loss in rupees due to change in the rate.***

• 1 Saudi Riyal = Rs. 22.400

Time of delivery rate

1 Saudi Riyal = Rs. 22.0827

Determine the loss in rupees due to change in the rate.

CP of a car = 15000 Riyals

On contract time rate of Riyal

1 Riyal = Rs. 22.400

Rate of 15000 Riyal = 15000×22.400

= Rs. 336000

After three months rate of Riyal

1 Riyal = Rs. 22.0827

Rate of 15000 Riyal = 15000×22.0827

= Rs. 331240.5

Loss = 336000 - 331240.5

= 4759.5

= Rs. 4759

9. ***A friend of Ali living in Saudi Arabia remits Ali 450 Riyals. The bank offers two conversions rate.T.T. Buying Rs. 22.3449 = 1 Riyal T/C Buying Rate: Rs. 22.2146 = 1 Riyal***

Which one of the rate will be applicable and also calculate the amount in rupees.

Solution:

1 Saudi Riyal = Rs. 22.3449 (By T.T)

1 Saudi Riyal = Rs. 22.2146 (By T/C)

By T.T the rate will be applicable and best.

1 Saudi Riyal = Rs. 22.3449

450 Saudi Riyal = 450×22.3449

= Rs.10055

Exercise 4.2

1. ***A financial institution charges Rs. 55 simple profit on a sum of money which is borrowed for five months. Given that the rate of profit is 12% per annum, find the sum of money.***

Solution:

$$\text{Profit} = \text{Rs. } 55$$

$$\text{Time/period} = 5 \text{ months} = \frac{5}{12} \text{ years}$$

$$\text{Rate} = 12\%$$

$$\text{Principal} = \frac{\text{Amount of Rate} \times 100}{\text{Rate} \times \text{Time}} \qquad \text{Formula}$$

$$= \frac{55 \times 100}{12 \times \frac{5}{12}}$$

$$= \frac{55 \times 100}{5}$$

$$= 11 \times 100$$

$$= \text{Rs. } 1100$$

2. ***Mrs. Javed invests in Savings Scheme Rs. 800 at 6% per annum and Rs. 1,200 at 7% per annum. What is her total amount of profit on these two investments?***

Solution:

1st condition

$$\text{Principal amount} = \text{Rs. } 800$$

$$\text{Rate} = 6\%$$

$$\text{Time/period} = 1 \text{ year}$$

$$\text{Profit (simple)} = \frac{Principal \times Time \times Rate}{100} \quad \textbf{Formula}$$

$$= \frac{800 \times 1 \times 6}{100}$$

2nd condition $= \text{Rs. } 48$

Principal amount $= \text{Rs. } 1200$

Rate $= 7\%$

Time/period $= 1 \text{ year}$

$$\text{Profit} = \frac{1200 \times 1 \times 7}{100}$$

$= \text{Rs. } 84$

Total profit $= 48 + 84$

Total profit $= \text{Rs. } 132$

3. How long would Rs. 1250 have to be deposited at 6% per year simple profit to gain Rs. 750 simple profit?

Solution:

Principal amount $= \text{Rs. } 1250$

Rate $= 6\%$

Profit $= \text{Rs. } 750$

Time/period $= ?$

$$\text{Period/Time} = \frac{Amount\ of\ Profit \times 100}{Rate \times Principal} \quad \text{Formula}$$

$$= \frac{750 \times 100}{6 \times 1250}$$

$= 10 \text{ years}$

4. Ali lent to Abid Rs. 4,800 for 7 months. At the end of this period Abid had to pay Ali profit of Rs. 119. What was the rate of simple profit per annum?

Solution:

Principal amount $= \text{Rs. } 4800$

Time/period $= 7 \text{ years}$

$$= \frac{7}{12} \text{ years}$$

Amount of profit = Rs. 119

Rate = ?

$$\text{Rate} = \frac{\text{Amount of Profit} \times 100}{\text{Time} \times \text{Principal}} \quad \text{Formula}$$

$$= \frac{119 \times 100}{\frac{7}{12} \times 4800}$$

$$= \frac{119 \times 100}{7 \times 400}$$

$$= \frac{17}{4}\%$$

$$= 4\frac{1}{4}\%$$

5. ***In a certain year, Javed puts Rs. 600 in a private bank at the end of March and Rs. 400 in the same bank at the end of June. The bank offers 3% per annum simple profit rate. Find the total amount Javed receives from the bank at the end of December in that year?***

Solution:

1st condition

Principal amount = Rs. 600

Rate = 3%

Time/period = 3 months

$$= \frac{3}{12} = \frac{1}{4} \text{ years}$$

$$\text{Profit (simple)} = \frac{\text{Principal} \times \text{Time} \times \text{Rate}}{100} \quad \text{Formula}$$

$$= \frac{600 \times 3 \times 1}{100 \times 4}$$

(i) $$= \text{Rs. } \frac{9}{2} = 4.50$$

2nd Condition

Principal amount = Rs. 600+400 = 1000

Rate = 3%

Time/period = 6 months

$$= \frac{6}{12} = \frac{1}{2} \text{ years}$$

$$\text{Profit (simple)} = \frac{Principal \times Time \times Rate}{100}$$ Formula

$$= \frac{1000 \times 3 \times 1}{100 \times 2}$$

= Rs. 15 (ii)

Total profit amount = 4.50 + 15 (i) + (ii)

= Rs. 19.50

Javed received at the end of Dec. = 1000 + 19.50

= Rs. 1019.50

6. ***At what annual rate of profit would a sum of Rs. 680 will increase to Rs. 850 in 3 years and 4 months?***

Solution:

Principal amount = Rs. 680

Amount = Rs. 850

Amount of profit = 850 - 680

= Rs. 170

$$\text{Time/period} = 3\frac{4}{12}$$

$$= 3\frac{1}{3} = \frac{10}{3} \text{ years}$$

Rate = ?

$$\text{Rate} = \frac{Amount\ of\ profit \times 100}{Time \times Principal} \quad \text{Formula}$$

$$= \frac{170 \times 100}{680 \times \frac{10}{3}}$$

$$= \frac{170 \times 100 \times 3}{680 \times 10}$$

$$= \frac{15}{2}$$

$$\text{Rate} = 7\frac{1}{2}\%$$

7. Copy and complete the following table with the help of formula given in this unit?

	Principal	Profit rate	Time	Simple profit	Amount
a	Rs. 12.000	8%	7 years		
b	Rs.500	11%		Rs.220	
c		9%	4 years	Rs.108	
d	Rs.3000		10 years	Rs.1200	
e			2 years	Rs.360	Rs.3960
f	Rs.1800		18 years	Rs.189	
g	Rs.4500		2 years		Rs.5040
h		5%		Rs.90	Rs.1290

Solution:

7(a) ***1st Part***

Principal amount = Rs. 12,000

Rate = 8%

Time = 7 years

Profit (simple) = ?

Amount = ?

$$\text{Profit (simple)} = \frac{Principal \times Time \times Rate}{100}$$

$$= \frac{12000 \times 7 \times 8}{100}$$

$$= 120 \times 7 \times 8$$

$$\text{Profit} = \text{Rs. } 6720 \quad \text{(i)}$$

2nd Part

$$\text{Amount} = \text{Principal} + \text{Profit}$$

$$= 12000 + 6720$$

$$= \text{Rs. } 18720 \quad \text{(ii)}$$

Solution:

7(b) $\text{Principal amount} = \text{Rs. } 500$

$\text{Rate} = 11\%$

$\text{Profit (simple)} = \text{Rs. } 220$

$\text{Rate} = ?$

$\text{Amount} = ?$

$$\text{Time} = \frac{Amount\ of\ Profit \times 100}{Rate \times Principal}$$

$$= \frac{220 \times 100}{500 \times 11}$$

$$= 4 \text{ years} \quad \text{(i)}$$

$$=$$

$$= 500 + 220$$

$$= \text{Rs. } 720 \quad \text{(ii)}$$

Solution:

7(c) $\text{Rate} = 9\%$

$\text{Time} = 4 \text{ years}$

$\text{Profit} = \text{Rs. } 108$

$\text{Principal amount} = ?$

$\text{Amount} = ?$

$$\text{Principal} = \frac{Amount\ of\ Profit \times 100}{Rate \times Time}$$

$$= \frac{108 \times 100}{9 \times 4}$$

$$= \text{Rs. } 300$$

$$\text{Amount} = \text{Profit} + \text{principal}$$

$$= 108 + 300$$

$$= \text{Rs. } 408$$

Solution:

7(d) $\text{Principal amount} = \text{Rs. } 3000$

$\text{Time} = 10 \text{ years}$

$\text{Profit (simple)} = \text{Rs. } 1200$

$\text{Profit rate} = ?$

$\text{Amount} = ?$

$$\text{Rate} = \frac{\textit{Amount of Profit} \times 100}{\textit{Time} \times \textit{Principal}}$$

$$= \frac{1200 \times 100}{10 \times 3000}$$

$$= 4\%$$

$$\text{Amount} = \text{Profit} + \text{principal}$$

$$= 1200 + 3000$$

$$= \text{Rs. } 4200$$

Solution:

7(e) $\text{Time} = 2 \text{ years}$

$\text{Profit} = \text{Rs. } 360$

$\text{Amount} = \text{Rs. } 3960$

$\text{Principal} = ?$

$\text{Rate} = ?$

$$\text{Principal} = \text{Amount} - \text{profit}$$

$$= 3960 - 360$$

$$\text{Principal} = \text{Rs. } 3600$$

$$\text{Rate} = \frac{\textit{Amount of Profit} \times 100}{\textit{Time} \times \textit{Principal}}$$

$$= \frac{360 \times 100}{2 \times 3600}$$

$$= 5\%$$

Solution:

7(f)

Principal = Rs. 1800

$$\text{Time} = 18 \text{ months} = \frac{18}{12} = \frac{3}{2} \text{ years}$$

Profit = Rs. 189

Rate = ?

Amount = ?

$$\text{Rate} = \frac{\text{Amount of Profit} \times 100}{\text{Time} \times \text{Principal}}$$

$$= \frac{189 \times 100}{\frac{3}{2} \times 1800}$$

$$= \frac{189 \times 100}{3 \times 900}$$

Rate = 7%

Amount = Principal + Profit

= 1800 + 189

Amount = Rs. 1989

Solution:

7(g)

Principal = Rs. 4500

Time = 2 years

Amount = 5040

Profit = ?

Rate = ?

Profit = Amount - Principal

= 5040 - 4500

Profit = Rs. 540

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$$\text{Rate} = \frac{\text{Amount of Profit} \times 100}{\text{Time} \times \text{Principal}}$$

$$= \frac{540 \times 100}{2 \times 4500}$$

$$= 6\%$$

Solution:

7(h)

Rate = 5%

Profit = Rs. 90

Amount = Rs. 1290

Principal = ?

Time = ?

Principal = Amount - Profit

= 1290 - 90

Principal = Rs.1200

$$\text{Time} = \frac{\text{Amount of Profit} \times 100}{\text{Rate} \times \text{Principal}}$$

$$= \frac{90 \times 100}{5 \times 1200}$$

$$\text{Time} = \frac{3}{2} \text{ years}$$

$$\text{Time} = 1\frac{1}{2} \text{ years}$$

8. *A bank **increased the rate of profit from 3.5% to 4% per annum. Find how much more profit Saeed would receive if he deposited Rs. 6400 in the bank for 6 months at the new profit rate.***

Solution:

1st condition

Principal = Rs. 6400

Time = 6 months

$$= \frac{6}{12} = \frac{1}{2} \text{ year}$$

1st Rate = 3.5%

$$= \frac{35}{10}\%$$

$$\text{Profit amount} = \frac{Principal \times Rate \times Time}{100}$$

$$= \frac{6400 \times 35 \times 1}{100 \times 10 \times 2}$$

Profit amount = Rs. 112

2nd condition

Principal = Rs. 6400

Time = $\frac{1}{2}$ year

Rate = 4%

$$\text{Profit} = \frac{Principal \times Rate \times Time}{100}$$

$$= \frac{6400 \times 4 \times 1}{100 \times 2}$$

Profit = Rs. 128

Additional amount = 2nd profit - 1st profit

= 128 - 112

Hence Additional amount = Rs.16

9. ***Mrs. Jamshed invested Rs. 4000 in X... Bank Limited which paid simple profit at a rate $7\frac{1}{4}\%$ per annum to its investors. After 2 years, the rate was increased to 8% per annum, Find the amount she had at the end of 7 years.***

Solution:

1st condition

Principal = Rs. 4000

$$\text{Rate} = 7\frac{1}{4}\%$$

$$= \frac{29}{4}\%$$

$$\text{Time} = 2 \text{ years}$$

$$\text{Profit} = \frac{Principal \times Rate \times Time}{100}$$

$$= \frac{4000 \times 29 \times 2}{100 \times 4}$$

2nd Condition

$$= \text{Rs. } 580 \qquad \text{(i)}$$

$$\text{Principal} = \text{Rs. } 4000$$

$$\text{Rate} = 8\%$$

$$\text{Time} = 7 - 2 = 5 \text{ years}$$

$$\text{Profit} = \frac{4000 \times 8 \times 5}{100}$$

$$= \text{Rs. } 1600 \qquad \text{(ii)}$$

$$\text{Hence Total profit} = 580 + 1600 \qquad \text{(ii),(i)}$$

$$\text{Total profit} = \text{Rs. } 2180$$

$$\text{After seven years Jamshed} = 4000 + 2180$$

$$= \text{Rs. } 6180$$

$$\text{Wife will get amount} = \text{Rs. } 6180$$

10. Mr. Dawood deposits a certain sum of money in ABC Limited. If the profit rate of the bank decreases from $3\frac{3}{4}\%$ per annum to $3\frac{1}{2}\%$ per annum, Mr. Dawood's profit will decrease by Rs. 50 in a year. Find the sum of money he deposits.

Solution:

1st condition

Deposit amount = Rs. x

Time = 1 year

$$\text{Rate} = 3\frac{3}{4}\% = \frac{15}{4}\%$$

$$\text{Profit} = \frac{Principal \times Rate \times time}{100}$$

$$= \frac{x \times 15 \times 1}{4 \times 100}$$

$$= \text{Rs. } \frac{15x}{400} \quad \text{(i)}$$

2nd condition

Principle = Rs. x

$$\text{Rate} = 3\frac{1}{2}\% = \frac{7}{2}\%$$

$$\text{Profit} = \frac{Principal \times Rate \times time}{100}$$

$$= \frac{x \times 7 \times 1}{2 \times 100}$$

$$= \text{Rs. } \frac{7x}{200} \quad \text{(ii)}$$

Difference in profit = Rs. 50

According to given condition

$$\frac{15x}{400} - \frac{7x}{200} = 50$$

$$400 \times \frac{15x}{400} - 400 \times \frac{7x}{200} = 400 \times 50 \text{ Multiplying by } 400$$

OR $15x - 14x = 20000$

$x = \text{Rs. } 20,000$

Principle amount = Rs. 20,000

11. Find the compound prfit on:

(i) Rs. 450 for 2 years at 10% per annum compounded yearly;

(ii) Rs. 700 for 3 years at 11% per annum compounded yearly;

(iii) Rs. 5000 for 2 years at $11\frac{3}{4}\%$ per annum compounded yearly;

(iv) Rs. 1200 for 3 years at 4% per annum compounded yearly;

(v) Rs. 10000 for 3 years at $7\frac{1}{2}\%$ per annum compounded yearly;

Solution:

11(i) Principal = Rs. 450

Rate = 10%

Time = 2 years

Compound profit = ?

$$\text{Compound profit} = Principal\left[1+\frac{Rate}{100}\right]^{time} - Principl$$

$$= 450\times\left[1+\frac{10}{100}\right]^{2} - 450$$

$$= 450\times\left[1+\frac{1}{10}\right]^2-450$$

$$= 450\times\left(\frac{11}{10}\right)^2-450$$

$$= 450\times\frac{11}{10}\times\frac{11}{10}-450$$

$$= 45\times11\times\frac{11}{10}-450$$

$$= \frac{5445}{10}-450$$

$$= \frac{5445-4500}{10}$$

$$= \frac{945}{10}$$

$$= \text{Rs. } 94.50$$

Solution:

11(ii) **Principal** = Rs. 750

Time = 3 years

Rate = 11%

Compound profit = ?

$$\text{Compound profit} = Principal\left[1+\frac{Rate}{100}\right]^{time}-Principle$$

$$= 750\times\left[1+\frac{11}{100}\right]^3-750$$

$$= 750\times\left[\frac{111}{100}\right]^3 - 750$$

$$= 750\times\frac{111\times111\times111}{100\times100\times100} - 750$$

$$= \frac{1025723250 - 750000000}{1000000}$$

$$= \frac{275723250}{1000000}$$

$$= \text{Rs. } 275.72$$

Solution:

11(iii) Principal = Rs. 5000

$$\text{Rate} = 11\frac{3}{4}\% = \frac{47}{4}\%$$

Time = 2 years

Compound profit = ?

$$\text{Compound Profit} = Principal\left[1+\frac{Rate}{100}\right]^{time} - Principle$$

$$= 5000\times\left[1+\frac{47}{4\times100}\right]^2 - 5000$$

$$= 5000\times\left[1+\frac{47}{400}\right]^2 - 5000$$

$$= 5000\times\left[\frac{400+47}{400}\right]^2 - 5000$$

$$= 5000\times\left(\frac{447}{400}\right)^2 - 5000$$

$$= 5000 \times \frac{447 \times 447}{400 \times 400} - 5000$$

$$= 5 \times \frac{447 \times 447}{4 \times 40} - 5000$$

$$= \frac{447 \times 447}{4 \times 8} - 5000$$

$$= \frac{199809}{32} - 5000$$

$$= \frac{199809 - 160000}{32}$$

$$\text{Compound profit} = \frac{39809}{32}$$

$$= \text{Rs. } 1244.03$$

$$\text{Compound profit} = \text{Rs. } 1244$$

Solution:

11(iv)

$$\text{Principal} = \text{Rs. } 1200$$

$$\text{time} = 3 \text{ years}$$

$$\text{Rate} = 4\%$$

$$\text{Compound profit} = ?$$

$$\text{Compound profit} = \left[1 + \frac{Rate}{100}\right]^{time} - Principle$$

$$= 1200 \times \left[1 + \frac{4}{100}\right]^3 - 1200$$

$$= 1200 \times \left[1 + \frac{1}{25}\right]^3 - 1200$$

$$= 1200 \times \left(\frac{26}{25}\right)^3 - 1200$$

$$= 1200 \times \frac{26 \times 26 \times 26}{25 \times 25 \times 25} - 120($$

$$= 48 \times 26 \times \frac{26 \times 26}{25 \times 25} - 1200$$

$$= \frac{843648}{625} - 1200$$

$$= \frac{843648 - 750000}{625}$$

$$= \frac{93648}{625}$$

$$= \text{Rs. } 149.84$$

Solution:

11(v) Principal = Rs. 10,000

time = 3 years

$$\text{Rate} = 7\frac{1}{2}\% = \frac{15}{2}\%$$

Compound profit = ?

$$\text{Compound profit} = \left[1 + \frac{Rate}{100}\right]^{time} - Principle$$

$$= 10,000 \times \left[1 + \frac{15}{2 \times 100}\right]^3 - 10,0($$

$$= 10,000 \times \left[1 + \frac{3}{40}\right]^3 - 10,000$$

$$= 10,000 \times \left[\frac{40+3}{40}\right]^3 - 10,000$$

$$= 10,000 \times \left[\frac{43}{40}\right]^3 - 10,000$$

$$= 10,000 \times \frac{43 \times 43 \times 43}{40 \times 40 \times 40} - 10,000$$

$$= 10,000 \times \frac{43 \times 43 \times 43}{40 \times 40 \times 40} - 10,000$$

$$= 2,000 \times \frac{43 \times 43 \times 43}{8 \times 40 \times 40} - 10,000$$

$$= 400 \times \frac{43 \times 43 \times 43}{8 \times 8 \times 40} - 10,000$$

$$= 50 \times \frac{43 \times 43 \times 43}{1 \times 8 \times 40} - 10,000$$

$$= 10 \times \frac{43 \times 43 \times 43}{1 \times 8 \times 8} - 10,000$$

$$= \frac{10 \times 43 \times 43 \times 43}{64} - 10,000$$

$$= \frac{795070}{64} - 10,000$$

$$= \frac{795070 - 64.000}{64}$$

$$= \frac{731070}{64}$$

$$= 11422.96$$

$$= \frac{155068}{64}$$

$$= \text{Rs. } 2422.94$$

12. ***Waseem invests Rs. 5000 at $5\frac{1}{4}\%$ per annum profit compounded annually. Find the amount at the end of the third year.***

Solution:

$$\text{Principal} = \text{Rs. } 5000$$

$$\text{Rate} = 5\frac{1}{4}\%$$

$$= \frac{21}{4}\%$$

$$\text{Time} = 3 \text{ years}$$

$$\text{Principal amount} = \textit{Principal} \times \left[1 + \frac{\textit{Rate}}{100}\right]^{\textit{time}}$$

$$= 5000 \times \left[1 + \frac{21}{4 \times 100}\right]^3$$

$$= 5000 \times \left[1 + \frac{21}{400}\right]^3$$

$$= 5000 \times \left[\frac{400 + 21}{400}\right]^3$$

$$= 5000 \times \left(\frac{421}{400}\right)^3$$

$$= 5000 \times \frac{421}{400} \times \frac{421}{400} \times \frac{42}{40}$$

$$= 25 \times \frac{421}{2} \times \frac{421}{400} \times \frac{421}{400}$$

$$= \frac{421}{2} \times \frac{421}{16} \times \frac{421}{400}$$

$$= \frac{74618461}{12800}$$

$$= \text{Rs. } 5829.56$$

13. Javed invests Rs. 800 at $12\frac{1}{2}\%$ per annum compound profit compounded half-yearly. What is the amount at the end of the first year?

Solution:

$$\text{Principal} = \text{Rs. } 800$$

$$\text{Yearly Rate} = 12\frac{1}{2}\%$$

$$\text{half yearly Rate} = \frac{25}{2}$$

$$= \frac{1}{2} \times \frac{25}{2}$$

$$= \frac{25}{4}\%$$

$$\text{time} = 1 \text{ year}$$

$$\text{time} = 2 \text{ half year}$$

$$\text{Total amount} = Principal \times \left[1 + \frac{Rate}{100}\right]^{time}$$

$$= 800 \times \left[1 + \frac{25}{4 \times 100}\right]^{2}$$

$$= 800 \times \left[1 + \frac{1}{4 \times 4}\right]^2$$

$$= 800 \times \left[1 + \frac{1}{16}\right]^2$$

$$= 800 \times \left(\frac{17}{16}\right)^2$$

$$= 800 \times \frac{17}{16} \times \frac{17}{16}$$

$$= 50 \times 17 \times \frac{17}{16}$$

$$= 25 \times 17 \times \frac{17}{8}$$

$$= \frac{7225}{8}$$

Total amount = Rs.903.13

Compound profit = 903.13 - 800

= Rs.103.13

14. Mr. Saleem invests Rs. 9000 at 2% per annum compound profit compounded daily. What is his amount at the end of the third day.

Solution:

Principal = Rs. 9000

Yearly Rate = 2%

$$= \frac{2}{365}\% \text{ daily}$$

time = 3 days

$$\text{Final amount} = Principal \times \left[1 + \frac{Rate}{100}\right]^{time}$$

$$= 9000 \times \left[1 + \frac{2}{365 \times 100}\right]^3$$

$$= 9000 \times \left[1 + \frac{1}{365 \times 50}\right]^3$$

$$= 9000 \times \left[1 + \frac{1}{18250}\right]^3$$

$$= 9000 \times \left[\frac{18250+1}{18250}\right]^3$$

$$= 9000 \times \left[\frac{182501}{18250}\right]^3$$

$$= 9000 \times 1.00005$$

$$= 9000 \times 1.00015$$

Final amount = Rs. 9001.35

Exercise 4.3

1. *A man borrowed Rs. 1460 from ABC Bank on the 3rd of March at* $12\frac{1}{2}\%$ *what should he pay on the 1st of July to pay off the debt.*

fortime period /Principle amount = Rs. 1460

March = 28 Rate = $12\frac{1}{2}\%$

April = 30

May = 31

June = 30

July = 1

120 days

$$= \frac{25}{2}\%$$

time = 120 days

$$\text{mark up} = \frac{1460 \times 25 \times 120}{100 \times 2 \times 365}$$

mark up = Rs. 60

2. *A shopkeeper borrowed Rs. 3540 from ABC Bank at* $10\frac{3}{4}\%$ *and lent the whole amount at* $11\frac{1}{2}\%$ *on the same day, what would be gianed from this after 3*

Solution:

1st condition

Principal amount = Rs. 3540

$$\text{Rate} = 10\frac{3}{4}\% = \frac{43}{4}\%$$

$$\text{time} = 3\frac{4}{12} = 3\frac{1}{3} = \frac{10}{3} \text{ years}$$

$$\text{mark up} \quad \frac{Principal \times Rate \times time}{100}$$

$$\text{mark up} = \frac{3540 \times 43 \times 10}{100 \times 4 \times 3}$$

mark up = Rs. 1268.50 (i)

= Rs. 3540

2nd condition

$$\text{Rate} = 11\frac{1}{2} = \frac{23}{2}\%$$

$$\text{time} = \frac{10}{3} \text{ years}$$

$$\text{mark up (Profit)} \quad \frac{Principal \times Rate \times time}{100}$$

$$= \frac{3540 \times 23 \times 10}{100 \times 2 \times 3}$$

= Rs. 1357 (ii)

Shopkeeper's profit = 1357 − 1268.50 (ii),(i)

= Rs. 88.50

3. ***XYZ Bank gained Rs. 3034 on its loan at 6% compound markup in 2 years. What amount did it lend?***

Solution:

Profit amount = Rs. 8034

time = 2 years

Rate = 6%

Principal amount = ?

Let amount = Rs. 100

Rate = 6%

time = 2 years

$$\text{Compound profit on Rs.100} = \text{Principal} \times \left[1+\frac{\text{Rate}}{100}\right]^{\text{time}} - \text{Principal}$$

$$= 100 \times \left[1+\frac{6}{100}\right]^{2} - 100$$

$$= 100 \times \left(\frac{106}{100}\right)^{2} - 100$$

$$= 100 \times \left(\frac{53}{50}\right)^{2} - 100$$

$$= 100 \times \frac{53 \times 53}{50 \times 50} - 100$$

$$= \frac{53 \times 53}{25} - 100$$

$$= \frac{2809}{25} - 100$$

$$\text{Compound profit on Rs.100} = \frac{2809 - 2500}{25} - 100$$

Now

$$\text{Rs.} = \frac{309}{25}$$

If $\frac{309}{25}$ is profit its loan $= 100$

If Re.1 is profit its loan $= 100 \times \frac{25}{309}$

If 8034 is profit its loan $= \frac{100 \times 25}{309} \times 8034$

$= 100 \times 25 \times 26$

Amount which lent = Rs. 65,000

4. ***A company borrowed Rs. 6.600 from ABC Bank Ltd at 8% simple markup per annum. How much did the company owe to the bank at the end of 11 months?***

Solution:

Principal amount = Rs. 6000

Rate = 8%

time = 11 months

Amount of profit $= \frac{11}{12}$ years

Profit (simple) $\frac{Principal \times Rate \times time}{100}$

$= \frac{6000 \times 8 \times 11}{100 \times 12}$

Profit = Rs. 440

5. ***XYZ Bank charges 2.25% per month simple markup on personal loans. If Ali borrows Rs. 6.400 for a period of 2 years 1 month, find the total markup he has to pay to XYZ Bank.***

Solution:

Principal amount = Rs. 6400

$$\text{Monthly rate} = 2.25\% = \frac{225}{100}\%$$

$$\text{time} = 2 \text{ years } 1 \text{ month}$$
$$= 25 \text{ months}$$

$$\text{Profit (simple)} = \frac{Principal \times Rate \times time}{100}$$

$$= \frac{6400 \times 225 \times 25}{100 \times 100}$$

$$= \frac{64 \times 225 \times 25}{100}$$

$$= \frac{\overset{16}{\cancel{64}} \times 225 \times \overset{1}{\cancel{25}}}{\underset{4}{\cancel{100}}}$$

$$= 16 \times 225$$

Profit (simple) mark up = 3600

6. ***Find out the compound markup on Rs. 250,000 for one year @ 14% compounded annually.***

Solution:

Principal amount = Rs. 2,50,000

time = 1 year

Yearly Rate = 14%

$$\text{compound mark up} = Principal \times \left[1 + \frac{Rate}{100}\right]^{time} - Principal$$

$$= 2,50,000 \times \left[1 + \frac{14}{100}\right]^{1} - 2,50,000$$

$$= 2,50,000 \times \left[1 + \frac{7}{50}\right] - 2,50,000$$

$$= 2,50,000 \times \frac{57}{50} - 2,50,000$$

$$= 5000 \times 57 - 2{,}50{,}000$$

$$= 285000 - 2{,}50{,}000$$

Compound mark up = Rs. 35, 000

7. Find compound profit on Rs. 600 for 4 years at 6 percent per annum.

Solution:

Principal amount = Rs. 600

Rate = 6%

= 4 years

Compound profit $= Principal \times \left[1 + \frac{Rate}{100}\right]^{time} - Principal$

$$= 600 \times \left[1 + \frac{6}{100}\right]^4 - 600$$

$$= 600 \times \left[1 + \frac{3}{50}\right]^4 - 600$$

$$= 600 \times \left(\frac{53}{50}\right)^4 - 600$$

$$= 600 \times \frac{53 \times 53 \times 53 \times 53}{50 \times 50 \times 50 \times 50} - 600$$

$$= \frac{6 \times 53 \times 53 \times 53 \times 53}{5 \times 5 \times 50 \times 50} - 600$$

$$= \frac{47342886}{62500} - 600$$

$$= 757.48 - 600$$

Compound profit = Rs. 157.48

8. ***Find the compound profit of Rs. 50000 at 4% for*** $1\frac{1}{2}$ ***years.***

Solution:

Principal amount = Rs. 50,000

Yeraly rate = 4%

time $= 1\frac{1}{2}$ years

time = One year and half year

$$= \frac{4}{2} = 2\%$$

Compound profit $= Principal \times \left[1 + \frac{Rate}{100}\right]^{time} - Principal$

Note this step $= 50,000 \times \left[1 + \frac{4}{100}\right]^{1} \times \left[1 + \frac{2}{100}\right]^{1} - 50,000$

$$= 50,000 \times \left[1 + \frac{2}{50}\right] \times \left[1 + \frac{1}{50}\right] - 50,000$$

$$= 50,000 \times \frac{52}{50} \times \frac{51}{50} - 50,000$$

$$= 1000 \times 52 \times \frac{51}{50} - 50,000$$

$$= 20 \times 52 \times 51 - 50,000$$

$$= 53040 - 50,000$$

Hence

Compound profit = 3040

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9. ***Find the compound profit on Rs. 54000 for one year at 12% per annum.***

Solution:

Principal amount = Rs. 54000

time = 1 year

Rate of % 1 year = 12%

Compound profit = ?

Compound profit $= Principal \times \left[1 + \frac{Rate}{100}\right]^{time} - Principal$

$= 54000 \times \left[1 + \frac{12}{100}\right]^{1} - 54000$

$= 54000 \times \frac{112}{100} - 54000$

$= 540 \times 112 - 54000$

$= 60480 - 54000$

$=$ Rs. 6480

Exercise 4.4

1. *If the amount of premium is calculated as. Yearly premium @ 4.5% of the policy income + policy fee @ 0.25% of the policy amount or at themost Rs. 200. Half yearly premium @ 52% of yearly premium. Quarterly premium @ 27% of yearly premium. Monthly premium @ 9% of yearly premium. Then complete the table below for calculation of the premiums. Aslo find the total amount he pays to the company.*

Amount of policy	Yearly premium	Half yearly premium	Quarterly premium	Monthly premium
(i) 50,000 *(ii)* 100,000 *(iii)* 150,000 *(iv)* 200,000				

Solution: (i)

Amount of policy = 50,000 Rs.

$$\text{1st Premium @ of 4.5\%} = \frac{4.5}{100} \times 50{,}000$$

$$= \text{Rs. } 2250$$

$$\text{Amount of policy @ 0.25} = \frac{0.25}{100} \times 50{,}000$$

$$= \text{Rs. } 125$$

Therefore

$$\text{Annual Premium} = \text{1st Premium} + \text{policy fee}$$

$$= 2250 + 125$$

$$= 2375 \text{ Rs.}$$

$$\text{Half yearly premium} = \frac{52}{100} \times \text{Annual premium}$$

$$\text{Half yearly premium} = \frac{52}{100} \times 2375$$

$$= \text{Rs. } 1235 .$$

$$\text{Quarterly premium} = \frac{27}{100} \times 2375$$

$$= \text{Rs. } 641.25.$$

$$\text{Monthly premium} = 9\% \text{ Annual premium}$$

$$= \frac{9}{100} \times 2375$$

$$= \text{Rs. } 213.75$$

Solution (ii)

$$\text{Total amount of policy fee} = \text{Rs. } 100{,}000$$

$$\text{1st premium@4.5\%} = \frac{4.5}{100} \times 100{,}000$$

$$\text{policy fee} = \text{Rs. } 4500$$

$$= \frac{0.25}{100} \times 100{,}000 = 250$$

which is more than 200

$$\text{Therefore Policy fee} = \text{Rs. } 200$$

$$\text{Yearly premium} = \text{1st premium} + \text{policy fee}$$

$$= \text{Rs. } 4500 + 200 = 4700$$

$$\text{Half yeraly} = \frac{52}{100} \times \text{yearly premium}$$

$$= \frac{52}{100} \times 4700$$

$$= \text{Rs. } 2444$$

$$\text{Quarterly premium} = \frac{27}{100} \times 4700$$

$$= \text{Rs. } 1269$$

$$\text{Monthly premium} = 9\% \text{ of yearly premium}$$

$$= \frac{9}{100} \times 4700$$

$$= \text{Rs.}423.$$

Solution (iii)

Total policy fee = Rs. 1,50,000

$$\text{1st premium@ 4.5\%} = \frac{4.5}{100} \times 1,50,000$$

$$= \text{Rs. } 6750$$

$$\text{Policy fee} = \frac{0.25}{100} \times 1,50,000$$

$$= \text{Rs. } 375$$

Policy fee is more than 200

$$= \text{Rs. } 200$$

Yearly premium = first premium + policy fee

$$= 6750 + 200$$

$$= \text{Rs. } 6950$$

$$\text{Half yearly premium} = \frac{52}{100} \times \text{yearly premium}$$

$$= \frac{52}{100} \times 6950$$

$$= 3614 \text{ Rs.}$$

$$= \frac{27}{100} \times$$

$$= \frac{27}{100} \times 6950$$

$$= \text{Rs. } 1876.50$$

Monthly premium = 9% of yearly premium

$$= \frac{9}{100} \times 6950$$

$$= \text{Rs. } 625.50$$

Solution: (iv)

Policy fee = Rs. 2,00,000

$$\text{1st premium @4.5\%} = \frac{4.5}{100} \times 2,00,000$$

$$= \text{Rs. } 9000$$

$$\text{Policy fee} = \frac{.25}{100} \times 2,00,000$$

$$= \text{Rs. } 500$$

500 policy fee is more than 200.

Therefore

Policy fee = Rs. 200

Yearly premium = 9000 + 200

= Rs. 9200

$$\text{Half yearly premium} = \frac{52}{100} \times \text{yearly premium}$$

$$= \frac{52}{100} \times 9200$$

$$= \text{Rs. } 4784$$

$$\text{Quarterly premium} = \frac{27}{100} \times \text{yearly premium}$$

$$= \frac{27}{100} \times 9200$$

$$= \text{Rs. } 2484$$

Monthly premium = 9% of yearly premium

$$= \frac{9}{100} \times 9200$$

$$= \text{Rs. } 828$$

No	Policy fee	yearly premmium Rs	Half yearly premium Rs	Quarterly premium	Monthly premium Rs
i	50,000	2250+125 ≐ 2375	1235	641.50	213.75

ii	1,00,000	4500+200 = 4700	2444	1269	423
iii	1,50,000	6750+200 = 6950	3614	1876.50	625.30
iv	2,00,000	9000+200 = 9200	4784	2484	828

2. ***Calculate the amount to be received by the heirs of an insured if he died 2 years after buying the policy while. The amount of policy = Rs. 50,000Premium is fixed @ 4.2% yearly Policy fee @ 0.3% Family income contract @ 0.6% Maturity period = 22 years Bonus @ 4.5% and Rs. 6000 yearly income is promised by the company.***

Solution: (i)

Policy fee = Rs. 50,000 (i)

Rs. 6000 for 20 years = 6000 × 20

= Rs.1,20,000 . (ii)

for 2 years amount of Bonus @ 4.5% $= \frac{4.5}{100} \times 50,000 \times 2$

Rs = 4500 (iii)

Amount to be received by the heirs = 50,000+1,20,000+4500 (i) + (ii) + (iii)

Rs = 1,74,500

3. ***Mr. Ahmed Ali insured his house worth Rs. 75,00,000 @ 2% for 4 years, calculate the amount paid in 4 years. While the rate of depreciation is 10% yearly.***

Solution:

Worth of house = Rs. 75,00,000

Rate of insurance = 2%

Time = 4 years

1st year amount of insurance $= \frac{2}{100} \times 75,00,000$

$= Rs.\ 1,50,000$

Depreciation $= \frac{10}{100} \times 75,00,000$

$= Rs.\ 750000$

Depreciation price $= 75,00,000 - 750000$

$= Rs.\ 6750000$

2nd year amount of insurance $= \frac{2}{100} \times 6750000$

$= Rs.\ 1,35,000$

Depriciation $= \frac{10}{100} \times 6750000$

$= Rs.\ 675000$

Depriciated price $= 6750000 - 675000$

$= Rs.\ 6075000$

3rd year amount of insurance $= \frac{2}{100} \times 6075000$

$= Rs.\ 121500$

4th year amount of insurance $= Rs.\ 0$

Total amount of insurance

1st Year = Rs. 1, 50, 000

2nd Year = Rs. 1,35,000

3rd Year = Rs. 1,21,500

4th Year = 0

Full paid amount $= 1,50,000 + 1,35,000 + 1,21,500$

$= Rs.\ 406500$

4. ***Mr. Nadeem insured his shop @ 3% for 3 years, the depreciation rate is 5% yearly. If he paid an amount of Rs. 21000 as the 1st premium, what is the worth of his shop. If he got a claim of Rs. 200,000 after two years, how much benefits did he get?***

Solution:

Let worth of a shop = Rs. x

yearly rate of insurance = 3%

$$\text{1st premium} = \frac{3}{100}x \text{ Rs.}$$

$$= \text{Rs. } 21000 \qquad \text{(i)}$$

$$\frac{3x}{100} = \text{Rs. } 21000$$

And $$x = 21000 \times \frac{100}{3}$$

$$x = \text{Rs. } 7{,}00{,}000$$

worth of shop = Rs. 7,00,000

after one year depriciated price of shop = 5%

$$\text{Rate of depriciation} = \frac{5}{100} \times 7{,}00{,}000$$

Worth of shop = 35,000

Depriciated price = 7,00,000 − 35000

2nd yearly premium = Rs. 6,65,000

$$= \frac{3}{100} \times 6{,}65{,}000$$

$$= \text{Rs. } 19950 \qquad \text{(ii)}$$

full amount paid by premium = 21000 + 19950 (i)+(ii)

claim amount = Rs.40,950 (iii)

= 2,00,000

Benifit = 2,00,000 - 40,950 (iii)

= Rs. 1,59,050

5. ***Mr. Adil bought a running business worth Rs. 10,00,000 and got it insured @ 2.5% as yearly premium for 4 years. After 3 years he got a claim of Rs. 500,000 for actual damages. How much loss had he recovered through insurance?***

Solution:

Policy fee = Rs. 10,00,000 (i)

1st premium @2.5% $= \frac{2.5}{100} \times 10,00,000$

= Rs. 25,000

After one year worth of business (10% less) $= \frac{10}{100} \times 10,00,000$

= Rs. 100000 (ii)

After one yera worth of business = 10,00,000 – 1,00,000

= Rs. 9,00,000

2nd year premium $= \frac{2.5}{100} \times 9,00,000$ (iii)

= Rs. 22500

After two years depriciation in worth $= \frac{10}{100} \times 9,00,000$

= Rs. 90,000

= 9,00,000 – 90,000

= Rs. 8,10,000

3rd year premium $= \frac{2.5}{100} \times 8,10,000$

= Rs. 20250

Total three years paid premium = 25000 + 22500 + 20250

= Rs. 67,750

Worth of claim = Rs. 5,00,000

Loss = 5,00,000 – 67,750

= Rs. 4,32,250

6. ***Mr. Javeed bought an insurance policy against his car worth Rs. 8,50,000, @ 4.25% for 3 years. What total amount will he pay as premium, if he had not claimed and damages during the period? Where depreciation is 10%?***

Solution:

Policy fee = 8,50,000

1st premium @ 4.25% $= \frac{4.25}{100} \times 8,50,000$

$= \frac{425 \times 8,50,000}{100 \times 100}$

= Rs. 36125 (i)

Depriciation $= \frac{10}{100} \times 8,50,000$

= Rs. 85000

Depriciated price = 8,50,000 - 85000

= Rs. 7,65,000

2nd year premium $= \frac{4.25}{100} \times 7,65,000$

$= \frac{425 \times 7,65000}{100 \times 100}$

= Rs. 32512.50 (ii)

3rd yearly premium = Rs. 0

Total premium = 36125 + 32512.50 (i)+(ii)

= Rs. 68637.50

7. ***Mr. Rehman bought a vehicle worth Rs. 7,50,000. He***

got it insured @ 3.5% for 5 years. How much he paid in total for covering the risks, if he had got a claim of damages worth Rs. 100,000 during the period? Where depreciation is 10%.

Solution:

Policy fee = Rs. 7,50,000

Rate of policy = 3.5%

Time of policy = 5 years

Rate of less price = 10%

claimed amount = Rs. 1,00,000

$$\text{1st year premium} = \frac{3.5}{100} \times 7,50,000$$

$$= \frac{35 \times 7,50,000}{10 \times 100}$$

= Rs. 26,250

$$\text{Depriciation} = \frac{10}{100} \times 7,50,000$$

= Rs. 7,50,000

Depriciated price = 7,50,000 - 75000

= Rs. 6,75,000

$$\text{2nd year premium} = \frac{3.5}{100} \times 6,75,000$$

$$= \frac{35 \times 6,75,000}{10 \times 100}$$

= Rs. 23625

$$\text{2nd depriciated price} = \frac{10}{100} \times 6,75,000$$

= Rs. 67500

depriciated price = 6,75,000 - 67500

= Rs. 6,07,500

$$= \frac{3.5}{100} \times 6,07,500$$

$$= \frac{35 \times 607500}{10 \times 100}$$

= Rs. 21262.50

$$\text{Depriciation} = \frac{10}{100} \times 6,07,500$$

= Rs. 60750

Depriciated price = 607500 - 60750

= Rs. 5,46,750

$$\text{4th year premium} = \frac{3.5}{100} \times 546750$$

$$= \frac{35 \times 546750}{10 \times 100}$$

= Rs. 19136.25

5th year premium = Rs. 0

Total paid premium =26250+23625+21262.50+19136.25

= Rs. 90273.75

Claim amount = Rs. 1,00,000

Benifit = 1,00,000 - 90273.75

Profit = Rs. 9726.25

8. ***Ms. Maria bought an insurance policy @ 3.25% for her car for 3 years. Her 1st premium is Rs. 26000. Tell the price of her car. Also calculate the amounts of her 2nd and 3rd premium.***

Rate of policy = 3.25%

Time = 3 years

1st premium = Rs. 26000

Worth of car = ?

Let worth of a car = Rs. x

$$\text{1st Premium} = \frac{3.25(x)}{100} \text{ First premium}$$

$$= \frac{325(x)}{100 \times 100}$$

According to condition

$$\frac{325(x)}{100 \times 100} = \text{Rs. } 26000$$

Therefore $x = \dfrac{26000 \times 100 \times 100}{325}$

$= \text{Rs. } 8,00,000$

Depriciation $= \dfrac{10}{100} \times 8,00,000$

$= \text{Rs. } 80000$

Depriciated price $= 8,00,000 - 80000$

$= \text{Rs. } 7,20,000$

Premium of second year $= \dfrac{3.25}{100} \times 7,20,000$

$$= \frac{325 \times 7,20,000}{100 \times 100}$$

Premium of second year = Rs. 23400

Premium of third year = Rs. 0

8,00,000 ; 23400, zero

Exercise 4.5

1. For each of the following.

(i) find the additional amount you have to pay by financing and

(ii) express the additional amount obtained in as a percentage of the cash price:

		Financing Term		
	Cash (Rs.)	Down (Rs.)	Monthly installment (Rs.)	Number of installments
(a)	Rs. 360	Rs. 50	Rs. 40	10
(b)	Rs. 900	Rs. 150	Rs. 75	12
(c)	Rs. 25000	Rs. 10000	Rs. 500	36

Solution: 1 (a)

1st condition:

Cash payment = Rs. 360

2nd condition

down payment = Rs. 50

Monthly installment = Rs. 40

Number of installment = 10

By installment paid = 40 × 10

= Rs. 400

By installment paid and down payment = 50 + 400

additional amount = Rs. 450

= 450 - 360

= Rs. 90

$$\text{additional amount with rate} = \frac{90 \times 100}{360}$$

= 25%

Solution: 1 (b)

Cash payment = Rs. 900

Down payment = Rs. 150

Monthly premium = Rs. 75

Number of installment = 12

Payment by installment = 75 × 12

= Rs. 900

Payment by installment and down payment = 150 + 900

= Rs. 1050

Additional amount = 1050 - 900

= Rs. 150

Additional amount with rate $= \frac{150}{900} \times 100 = 16\frac{2}{3}\%$

or = 16.67%

Solution: 1 (c)

Cash payment = Rs. 25000

Down payment = Rs. 10000

Monthly installment = Rs. 500

Number of installment = 36

Payment by installment = 500 × 36

= Rs. 18000

Payment by installment and down payment = 18000 + 10000

= Rs. 28000

= 28000 - 25000

Additional amount = Rs. 3000

amount which is taken as cash rate $= \frac{3000}{25000} \times 100$

= 12%

2. ***Pervaiz buys a window air-conditioner at Rs. 900. He pays 20% deposit and the outstanding balance plus markup in 48 months. Markup on the balance is charged at 10% Find***

(i) the cost of his monthly installment;

(ii) the amount he saves by paying cash.

Solution:

Cash payment of air-condition Rs. 900

$$20\% \text{ Cash payment } \frac{20}{100} \times 900$$

$$= \text{Rs. } 180$$

$$\text{Balance amount } = 900 - 180$$

$$= \text{Rs. } 720$$

$$\text{Rate of mark up} = 10\%$$

$$= \frac{720 \times 10 \times 4}{100}$$

$$= \text{Rs. } 288$$

$$\text{Payment with mark up} = 720 - 288$$

$$= \text{Rs. } 1008$$

$$\text{Monthly installment} = \frac{1008}{48}$$

$$= \text{Rs. } 21$$

3. ***On each of the following***

(i) find the financial price of the goods and

(ii) express the amount saved by paying cash as a percentage of the cash price

	Item	Cash Rs.	Deposit	Number of Installments	Monthly Installments Rs.
(a)	Computer	Rs. 200	10%	24	Rs. 9
(b)	Printer	Rs. 450	15%	18	Rs. 25
(c)	Scanner	Rs. 1600	25%	30	Rs. 52

Solution 3 (a)

Cash amount of computer = Rs. 200

10% cash amount paid = $\frac{10}{100} \times 200$

= Rs. 20

Saving amount = 200 - 20 = Rs. 180

Monthly installment = Rs. 9

Number of installment = Rs. 24

Cash payment with installment = 9 × 24

= Rs. 216

Additional payment = 216 - 180

= Rs. 36

Financial price of computer = 200 + 36

= Rs.236 *(i)*

$= \left[\frac{Additional\ amount \times 100}{Cash\ payment}\right]$

Amount saved by paying cash as a percentage = $\frac{36 \times 100}{200}$

= 18%

Solution 3 (b)

Cash amount = Rs. 450

Cash payment 15% = $\frac{15}{100} \times 450$

= Rs. 67.50

Balance amount = 450 - 67.50 = Rs. 382.50

Monthly installment = Rs. 25

Number of installment = 18

nstallmentCash payment withi = 25 × 18

= Rs. 450

Additional payment = 450 - 382.50

Financial price of printer = Rs. 67.50

Amount saved by paying cash as a percentage $= 450 + 67.50$

$$\left[\frac{\text{Additional amount} \times 100}{\text{Cash payment}}\right]$$

$$= \text{Rs. } 517.50 \quad (i)$$

$$= \frac{67.50 \times 100}{450}$$

$$= 15\% \quad (ii)$$

Solution 3 (c)

Cash amount of scanner = Rs. 1600

25% Cash payment $= \frac{25}{100} \times 1600$

$= \text{Rs. } 400$

Balance $= 1600 - 400 = \text{Rs. } 1200$

Monthly installment = Rs. 52

Number of installment = 30

Paid amount by installment $= 52 \times 30$

$= \text{Rs. } 1560$

Additional amount $= 1560 - 1200$

$= \text{Rs. } 360$

Financial price of scanner $= 1600 + 360$

$= \text{Rs. } 1960 \quad (i)$

$$= \frac{360 \times 100}{1600}$$

Paying cash as a percentage $= 22\frac{1}{2}\%$

$= 22.50\% \quad (ii)$

4. For each of the following, find

(i) the monthly installment and

(ii) the difference in the hire purchase price and the cash price as a percentage of the cash price:

	Cash	Hire-purchase terms
(a)	Rs. 800	Rs. 100 deposit; balance 8%; 1 year
(b)	Rs. 8000	Rs. 200 deposit; balance 10%; $2\frac{1}{2}$ year
(c)	Rs. 1200	Rs. 200 deposit; balance 15%; $1\frac{1}{3}$ year

Solution 4 (a)

$$= \text{Rs. } 800$$

$$\text{Cash payment} = \text{Rs. } 100$$

$$\text{Balance} = 800 - 100 = \text{Rs. } 700$$

$$\text{Rate of mark up} = 8\%$$

$$\text{Time} = 1 \text{ year}$$

$$\text{Mark up} = \frac{Principal \times Rate \times time}{100}$$

$$= \frac{700 \times 8 \times 1}{100} = 56$$

$$\text{Amount paid by instalment} = 700 + 56$$

$$= \text{Rs. } 756$$

$$\text{Time} = 1 \text{ year} = 12 \text{ months}$$

$$\text{Monthly installment} = \frac{756}{12} = 63 \qquad (i)$$

$$\text{Amount saved by paying cash as a percentage} = \frac{additional\ amount \times 100}{Cash\ amount}$$

$$= \frac{56 \times 100}{800}$$

$$= 7\%$$

Solution 4 (b)

$$\text{Cash price} = \text{Rs. } 8000$$

$$\text{Cash payment} = \text{Rs. } 3200$$

$$\text{Balance} = 8000 - 3200$$
$$= \text{Rs. } 4800$$
$$\text{Rate of mark up} = 10\%$$
$$\text{Time} = 2\frac{1}{2} = \frac{5}{2} \text{ years}$$
$$\text{Mark up} = \frac{Principal \times Rate \times time}{100}$$
$$= \frac{4800 \times 10 \times 5}{100 \times 2}$$
$$\text{Mark up} = \text{Rs. } 1200$$
$$\text{Payment by instalment} = 4800 + 1200$$
$$= \text{Rs. } 6000$$
$$\text{Time} = \frac{5}{2} \text{ years} = 30 \text{ months}$$
$$\text{Monthly installment} = \frac{6000}{30}$$
$$= \text{Rs. } 200 \qquad (i)$$
$$\text{Amount saved by paying cash as a percentage} = \frac{Mark\ up \times 100}{Cash\ amount}$$
$$= \frac{1200 \times 100}{8000}$$
$$= 15\%$$

Solution 4 (c)

$$\text{Cash price} = \text{Rs. } 1200$$
$$\text{Cash payment} = \text{Rs. } 200$$
$$\text{Balance} = 1200 - 200$$
$$= \text{Rs. } 1000$$
$$\text{Rate of mark up} = 15\%$$
$$\text{Time} = 1\frac{1}{3} = \frac{4}{3} \text{ years}$$

$$\text{Mark up} = \frac{Principal \times Rate \times time}{100}$$

$$= \frac{1000 \times 15 \times 4}{100 \times 3}$$

$$= \text{Rs. } 200$$

$$\text{Amount paid in instalment} = 1000 + 200$$

$$= \text{Rs. } 1200$$

$$\text{Time} = \frac{4}{3} \text{ years} = 16 \text{ months}$$

$$\text{Monthly instalment} = \frac{1200}{16}$$

$$= \text{Rs. } 75$$

$$\text{Amount saved by paying cash as a percentage} = \frac{Mark\ up \times 100}{Cash\ amount}$$

$$= \frac{200 \times 100}{1200}$$

$$= \frac{50}{3}$$

$$= 16\frac{2}{3}\%$$

5. ***The cash price of a computer package deal was Rs. 3200. Markup paid @ 15% down payment and the outstanding balance plus markup over 24 months. Markup on the balance was charged at 9.5%.***

(i) ***Find the cost of the package deal if it is bought on hire-purchase.***

(ii) ***Find the difference between the hire-purchase price and the cash price.***

(iii) ***Express the difference obtained in (ii) as a percentage of the cash price.***

Solution:

Cash price of computer package = Rs. 3200

$$\text{Down payment} = \frac{15}{100} \times 3200$$

Cash payment = Rs. 480

Balance = 3200 - 480

= Rs. 2720

Rate of mark up = $9.5\% = 9\frac{1}{2} = \frac{19}{2}\%$

Time = 24 months

Time = 2 years

Mark up =

$$= \frac{2720 \times 19 \times 2}{100 \times 2}$$

Mark up = Rs. 516.80 *(i)*

= Principle + Mark up

= 3200 + 516.80

= 3716.80 روپے *(ii)*

$$\text{Amount saved by paying cash as a percentage} = \frac{\textit{Mark up} \times 100}{\textit{Cash price}}$$

$$= \frac{516.80 \times 100}{3200}$$

= 16.15%