**3. Simple & Compound Interest**

**Solution Exercise – Easy**

1. (b) : Here, *P* = 8000, *T* = 5 years, *R* = 6%

∴ S.I. =  = 2400

2. (b) : Amount under compound interest

Amount = *P*

39930 = *P*

⇒ 39930 = *P* (1.1)3

⇒ *P* = 

⇒ *P* =  = Rs. 30,000

3. (c) : Amount under simple interest

12800 = 

12800 = *P* (1.6)

*P* =  = Rs. 8000

4. (c) : = *P* 

= 20,000 

= Rs. 26709

5. (b) : The amount at the end of 2nd year will be the principal for the 3rd year.

Amount at the end of the 2nd year

= 8000 = 8000 × 1.21

= 9680

Hence, interest for the 3rd year

= 9680 (0.1) = 968

6. (c) : Principal (*P*) = Rs. 4000 and amount (*A*)

= Rs. 4800.

∴ Interest (*I*) = 800

⇒ 800 = 

For *P* = Rs. 6000, *n* = 4, and *r* = 10%,

*I* =  = Rs. 2400

Therefore, Rs. 6000 becomes Rs. 6000 + Rs. 2400 = Rs. 8400 at the end of the 4 years.

7. (b) : Here, *P* = 3000, *T* = 2 years = 4 half - years, *R* = 10%

S.I. =  = 1200

∴ Amount paid to *Y* = *P* + S.I.

= 3000 + 1200 = 4200

8. (b) : Let sum be *P*.

Then, S.I. = 

∴ Amount = *P* + 

According to the question,



∴ *P* =  = 5200

9. (b) : If sum = *P*

Then, the sum after 20 years = 5*P*

∴ S.I. = 5*P* – *P* = 4*P*

Now, 4*P* = 

⇒ 4 = 

∴ R = 20%

10. (c) : Interest in 4 years

= 30

Interest for 1 year = 

= 7.5

R =  × 100

= 0.5%

11. (b) : According to the question,

= = 60

⇒  = 60

∴ *R* = 30%

12. (c) : S.I. = 650 − 500 = 150, *P* = 500, *T* = 3 years

Again, S.I. = 

⇒ 150 = 

∴ *R* = 10%

New rate = (10 + 4) = 14%

New S.I. =  = 210

∴ New amount = 500 + 210 = 710

13. (c) : Here, *P* = 8000, *R* = 4%, *T* = 2 year

Now, according to the formula,

Amount = *P* 



= 10816

∴ C.I. = (10816 – 10000) = 816

14. (b) : Here, Principal (*P*) = 8000

Rate (*R*) = 4% p.a.

Time (*T*) = 2 years

Now, according to the formula,

Amount = 

= 

= 8659.45

∴ Compound Interest = (8659.45 – 8000) = 659.45

15. (c) : Here, *P* = 16000, *n* = 9 months =  years, *R* = 20% p.a.

According to the formula,

Amount = *P*

= 

= 16000 ×  = 18522

∴ C.I. = (18522 – 16000) = 2522

16. (a) : *P* = Rs. 100000, *T* = 4, *R* = 12%

*I* =  = 48000

17. (d) : Use I = 

*P* = ?, *T* = 5, *R* = 7.5%

You need to find *P*,

P =  × 100 = 480000

Money invested = Rs. 480000

∴ Total Amount received after 5 years = 4,80,000 + 1,80,000

= 6,60,000

18. (b) : If Principal = *P*, Time = *n* years, Rate percent = *n*, then



or *n*2 = 

∴ n =  = 2.5

Therefore, rate percent is 2.5

19. (c) : We know, *R* × *T* = 100 (*N* – 1)

∴ *R* =  = 10%

20. (b) : 926.10 = 800  or,

= or.

*n* = 3

21. (b) : 441 = 400 

⇒ 

⇒ *r* = 5%

22. (b) : 15972 = 12000 

=

⇒ 

⇒ 

⇒ *r* = 10%

23. (b) : (12000 – 8000) = 

⇒ *t* =  years.

24. (b) : *A = P* 

*A* = 8000 (1.08) (1.1) (1.12)

*A* = 10644.48

C.I. = 2644.48 = (10644.48 – 8000)

25. (b) : S.I. = 2*P* – *P* = *P* (Interest = Amount – Principle)

*P* =  ⇒ t = 5 years

**Solution Exercise – Medium**

1. (b) : The difference between Rs. 8640 and Rs. 7200 *i.e*. Rs. 1440 is the interest for 3rd year.

This is equal to the interest for one year on Rs. 7200. Therefore

7200 × 

= 1440 ⇒ *r* = 20% p.a.

*P*  = 7200

⇒ *P* =  = Rs. 5000

2. (c) : According to the question,

 = 2400 – 2250

⇒  = 150

⇒  = 150

⇒ *PR* = 5000

For 4 years, S.I. =  = 200

∴ Sum = 2250 – 200 = 2050

Again, we have, *PR* = 5000

∴ *R* = 2.43%

3. (c) :  × *P* × 10%

= 765

⇒  = 765

⇒  = 765 × 100

⇒ *P* =  = 9000d

4. (c) : Let original amount = *P*

*P* becomes 6*P* in the 7 years

∴ S.I. = 6*P* – *P* = 5*P*

Now *P* = should become 16*P*

∴ S.I. = 16*P* – *P* = 15*P*

When S.I. = 5*P*, 7 years are required.

∴ For S.I. = 15*P*, years = 3 × 7 = 21 years.

5. (c) : Let the Principal be Rs. ‘*x*’

∴  or,

1 +  or, *R* = 33.33% p.a.

6. (d) : Let the value of each installment be *x*. Rs. 21,000 at 10% p.a. will become Rs. 23,100 at the end of the 1st year. Therefore balance is Rs. (23,100 – *x*) = *x*. This sum at 10% p.a. will become 1.1 (23,100 – *x*) at the end of the 2nd year.

Another amount of *x* is to be paid to discharge the loan completely.

∴ 1.1 (23,100 – *x*) = *x*

⇒ 1.1 × 23,100 = 2.1 *x*

*x* =  = Rs. 12,100.

7. (b) : At 10% p.a., amount at the end of the 1st year is Rs. 16500, out of which Rs. 8000 is repaid. The balance Rs. 8500 is the principal for the 2nd year, which amounts to Rs. 9350 at the end of the 2nd year. Hence to discharge the loan completely at the end of the 2nd year, Modita has to repay Rs. 9350.

8. (b) : S.I. for 2 years = 2 × 5% = 10% *P*

C.I. for 2 years = 5 + 5 +  = 10.25% *P*

∴ C.I. – S.I. = 10.25% *P* – 10% *P*

∴ 200 =  × *P*

∴ *P* =  = 80,000

9. (b) : Let the original sum be Rs. *P*.

∴  = 900

or,  = 900 or *P* = 7500.

10. (b) : Let the sum invested at 14% p.a. be Rs. *x*.

∴  = 3500

or, 28*x* + 360000 – 30*x* = 350000

or, 2*x* = 10000 or, *x* = 5000

∴ Amount invested at 14% p.a. = Rs. 5000

Amount invested at 15% p.a. = Rs. 7000

11. (a) : Let the amount invested at 10% be *x*.

then, amount invested at 12% = (16500 − *x*)

∴ 

⇒ 20*x* + 396000 − 24*x* = 362000

⇒ 34000 = 4*x*

⇒ *x* = 8500

12. (c) : Net income = 32000



= 32000 ×  = Rs. 37620

∴ Net profit = 37620 – 32000 = Rs. 5620

13. (a) : Given,  × 9 = 65 + *T*

or,  (90 + *T*) = (65 + *T*)

⇒ (4*T* – 3*T*) = (270 – 260)

or *T* = Rs. 10

14. (c) : 3000 × 

⇒ 2*x* = (18000 – 15000) ⇒ *x* = Rs. 1500

15. (b) : Let the present value of money be *x*.

Then, 

⇒ 0.12*x* + *x* = 10028

⇒ *x* = 

This amount after 3 months.

= 

= 

=  = 9222.17 ≈ Rs. 9200

**Solution Exercise – Difficult**

1. (b) : Amount borrowed = *X*

Amount Outstanding at the end of year 1 = 1.1*X* – 100

Amount Outstanding at the end of year 2 = (1.1*X* – 100) × 1.1 – 200

= 1.21*X* – 310.

Amount Outstanding at the end of year 3 = (1.21*X* – 310) × 1.1 – 300

= 1.331*X* – 641.

Amount Outstanding at the end of year 4 = 0

(1.331*X* – 641) × 1.1 – 44 = 0

*X* = Rs. 511.65

2. (b) : Let the repayments be Rs. *a – d*, Rs. *a* and Rs. *a + d*

*a – d + a + a + d* = 54000

3*a* = 54000

*a* = 18000

The payment at the end of year 2 is Rs. 18000.

Borrowed amount = Rs. 45000

Amount outstanding at the end of year 1

= (45000 × 1.1) – (18000 – *d*)

= 31500 + *d*

Amount outstanding at the end of year 2

= [(31500 + *d*) × 1.1] – 18000

34650 + 1.1*d* – 18000 = 16650 + 1.1*d*

Amount outstanding at the end of year 3

= [(16650 + 1.1*d*) × 1.1] = 18000 + *d*

18315 + 1.21*d* = 18000 + *d*

0.21*d* = – 315

*d* = – 1500

The payments are Rs. 19500, Rs. 18000 and Rs. 16500

3. (d) : 

⇒ 

∴ *P*1 =  × 510000 = 270000

Hence, Share of elder brother is 270000.

4. (a) : Amount which is to be returned on completion of studies

= 800000 × (1.08)2

= 933120

But only half of 933120 is returned which is equal to Rs. 466560

∴ Amount which is returned after two year of completion of studies

= 466560 

= 564537.6

Total amount returned

= 466560 + 564537.6

⇒ 1031097.6

= 10.311 Lakh

5. (b) :

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 1000 | → | 1100 |  |  |  |  |
|  |  | ↓ |  |  |  |  |
|  |  | 2200 | → | 2420 |  |  |
|  |  |  |  | ↓ |  |  |
|  |  |  |  | 4840 | → | 5324 |
|  |  |  |  |  |  | ↓ |
|  |  |  |  |  |  | 10648 |

6. (c) : Let the amount of investment with each one be Rs. 1000, then

Pinku = Minku

[1000 (1.1)2] = [250 (1.1)2] + 

⇒ *r* = 10.5%

7. (b) : Total time = 25 + 5 = 30 years

Again no. of time periods for cost increment =  = 5

and no. of time periods for rupee depreciation =  = 6

Now, the net value of the plot = 10000 × (1.05)5 × (0.98)6

= Rs. 11300

8. (b) : 





 years

9. (b) : Principal = *x*,

rate = *r*





Solving,

we get *x* = 300, *r* = 5

10. (a) : *P*(1.06)(1.08)(1.1)(1.2)  − *P* = *P*(1.1)5 − *P*

*P*(1.06)(1.08)(1.2)  = *P*(1.1)4

(1.06)(1.08)(1.2)  = (1.1)4



 = .0658

*x* = 6.58%