Compound Interest (LOD 01)

1. The difference between the compound interest and the simple interest on a certain sum at 5% per annum for 2 years is Rs. 1.50. The sum is ?

a) Rs. 600 b) Rs. 500

c) Rs. 400 d) Rs. 300

2. If the compound interest on a certain sum for 2 years at 12.5% per annum is 170, the simple interest is ?

a) Rs. 150 b) Rs. 152.50

c) Rs. 160 d) Rs. 162.50

3. A sum amounts to Rs. 1352 in 2 years at 4% compound interest.The sum is ?

a) Rs. 1300 b) Rs. 1250

c) Rs. 1260 d) Rs. 1200

4. Rs. 800 at 5% per annum compound interest will amount to Rs. 882 in ?

a) 1 years b) 2 years

c) 3 years d) 4 years

5. The compound interest on Rs. 2800 for 1 1/2 years at 10% per annum is ?

a) Rs. 441.35 b) Rs. 436.75

c) Rs. 434 d) Rs. 420

6. If Rs. 7500 are borrowed at compound interest at the rate of 4% per annum, then after 2 years the amount to be paid is ?

a) Rs. 8082 b) Rs. 7800

c) Rs. 8100 d) Rs. 8112

7. A sum amounts to Rs. 3149.29 in 3 years at compound interest. The sum is ?

a) Rs. 1500 b) Rs. 2000
c) Rs. 2500 d) Rs. 3000

8. A sum of money placed at compound interest doubles itself in 5 years. It will amount to eight times itself in ?

a) 15 years b) 20 years
c) 12 years d) 10 years

9. The compound interest on a certain sum of money for 2 years at 10% per annum is Rs. 420. The simple interest on the same sum at the same rate and for the same time will be ?

a) Rs. 350 b) Rs. 375

c) Rs. 380 d) Rs. 400

10. Rs. 1600 at 10% per annum compounded half yearly amount to Rs. 1944.81 in ?

a) 2 years b) 3 years

c) 1 1/2 years d) 21/2

11. What will be the approximate compound interest on Rs. 101005 at 10% p.a. for 3 years ?

a) Rs. 4500 b) Rs. 3000

c) Rs. 3300 d) Rs. 3600

12. If the compound interest of a certain sum of money for two successive years be Rs, 225 and Rs. 238.50. What is the rate of interest per annum ?

a) 5% b) 6%

c) 7 ½ d) 10%

13. A moneylender lends Rs. 2000 for 6 months at 20% per annum whereas the interest is compounded quarterly. After the given period he will get the amount of ?

a) Rs. 2205 b) Rs. 2200

c) Rs. 2160 d) Rs. 2040

14. In what time will Rs. 6250 amount to Rs. 6632.55 at 4% compound interest payable half yearly ?

a) 3 years b) 3/2 years

c) 1 years d) 5/2 years

15. Find the effective annual rate of 4 per cent per annum compound interest paid quarterly.?

a) 4.0604% b) 4.604%

c) 5.0605% d) 5.605%

16. In what time will Rs. 390625 amount to Rs. 456976 at 4 per cent compound interest ?

a) 2 years b) 4 years

c) 3 years d) 5 years

17. Find the effective annual rate of 5 per cent per annum compound interest paid half yearly ?

a) 1.025% b) 6.0625%

c) 5.062% d) None of these

18. At what rate of compound interest per annum will a sum of Rs. 1200 become Rs. 1348.32 in 2 years ?

a) 7% b) 7.5%

c) 6% d) 6.5%

19. A sum of ₹ 2400 deposited at CI, Double after 5 yr. After 20 yr it will become ?

a) ₹ 24000 b) ₹ 38400

c) ₹ 19200 d) Cannot be determined

20. Rohit earns an interest of ₹ 1656 for the third year and ₹ 1440 for the second year on the same sum. Find the rate of interest if it is lent at compound interest ?

a) 18% b) 12%

c) 15% d) None of these

21. What will be the compound interest on a sum of ₹ 50000 after 3 yr at the rate of 12% pa?

a) ₹ 80000 b) ₹ 70246.40

c) ₹ 20246.40 d) ₹ 70000

22. A sum amounts to ₹ 1352 in 2 yr at 4% compound interest. The sum is

a) ₹ 1250 b) ₹ 1200

c) ₹ 1300 d) ₹ 1260

23. What will be the present worth of ₹ 169 due in 2 yr at 4 % pa compound interest ?

a) ₹ 156.25 b) ₹ 160

c) ₹ 150.50 d) ₹ 154.75

24. Find the compound interest on ₹ 31250 at 16 % pa compounded quaterly for 9 months.

a) ₹ 4000 b) ₹ 3902

c) ₹ 3500 d) ₹ 4200

25. A sum amounts to ₹ 2916 in 2 yr and ₹ 3149.28 in 3 yr at compound interest. The sum is ?

a) ₹ 1500 b) ₹ 2500

c) ₹ 2000 d) ₹ 3000

26. Ram invests ₹ 5000 in a bond which gives interest at 4% per annum during the first year, 5% during the second year and 10% during the third year. How much does he get at the end of third year ?

a) ₹ 7000 b) ₹ 5006

c) ₹ 6006 d) ₹ 5506

27. A sum of money was lent at 10% per annum, compounded annually, for 2 years. If the interest was compounded half-yearly, he would have received ₹ 220.25 more. Find the sum.

a) ₹ 40000 b) ₹ 45000

c) ₹ 48000 d) ₹ 50000

28. A sum of ₹ 1682 is to be divided between A and B who are respectively 20 years and 22 years old. They invest their shares at 5% per annum, compounded annually. At the age of 25 years both receive equal amounts. Find the share of each.

a) ₹ 730 ; ₹ 952 b) ₹ 750 ; ₹ 932

c) ₹ 700 ; ₹ 982 d) ₹ 800 ; ₹ 882

29. Divide ₹ 10230 into two parts such that the first part after 10 years is equal to the second part after 7 years, compound interest being 20% per annum compounded yearly.

a) ₹ 4150 ; ₹ 6080 b) ₹ 3950 ; ₹ 6280

c) ₹ 3750 ; ₹ 6480 d) ₹ 3550 ; ₹ 6680

30. A sum amounts to ₹ 9680 in 2 years and to ₹ 10648 in 3 years compounded annually. Find the principal and the rate of interest per annum.

a) 12% ; ₹ 7500 b) 10% ; ₹ 8000

c) 11% : ₹ 11000 d) None of these

31. If the difference between CI and SI on a certain sum at r% per annum for 3 years is Rs x, find the expression for the principal sum. If the difference between CI and SI on a certain sum at 4% for 3 years is Rs. 608. Find the sum.

a) ₹ 125000 b) ₹ 120000

c) ₹ 130000 d) ₹ 122250

32. If the difference between CI and SI on a certain sum at r% per annum for 2 years is ₹ x, find the expression for principal sum. If the difference between CI and SI on a certain sum at 4% per annum for 2 years is ₹ 25, find the sum.

a) ₹ 18625 b) ₹ 16625

c) ₹ 14625 d) ₹ 15625

33. The simple interest on a certain sum for 2 years is ₹ 50 and the compound interest is ₹ 55. Find the rate of interest per annum and the sum.

a) 16% P.a. ; ₹ 200 b) 15% P.a. ; ₹ 150

c) 20% P.a. ; ₹ 125 d) 18% P.a. ; ₹ 175

34. The compound interest on a sum of money at 5% per annum for 3 years is ₹ 2522. What would be the simple interest on this sum at the same rate and for the same period ?

a) ₹ 2500 b) ₹ 2400

c) ₹ 2450 d) ₹ 2350

35. If SI on a certain sum of money at 4% per annum for 2 years be ₹ 125, what would be the interest if it was to be compounded annually at the same rate and for the same time period?

a) ₹ 127.50 b) ₹ 125.50

c) ₹ 135.50 d) ₹ 138

36. In what time will ₹ 15625 amount to ₹ 17576 at 4% per annum, compounded yearly?

a) 4 years b) 2.5 years

c) 3 years d) 3.5 years

37. Find the ratio of simple interest to compound interest for 2 years at 4% per annum, compounded yearly in case of compound interest.

a) 50 : 53 b) 50 : 51

c) 49 : 50 d) 48 : 53

38. Find the present worth of ₹ 9261 due 3 years hence at 5% per annum compounded yearly.

a) ₹ 8000 b) ₹ 8200

c) ₹ 8500 d) ₹ 8700

39. Find compound interest on ₹ 10,000 for 3

1 /2 years at 10% per annum, compounded yearly.

a) ₹ 3675.50 b) ₹ 3775.50

c) ₹ 3875. 50 d) ₹ 3975.50

40. Find compound interest on ₹ 5000 for 2 years at 10% per annum, compounded half-yearly.

a) ₹ 1077.5 b) ₹ 1072.5

c) ₹ 1000 d) ₹ 1100

Compound Interest (LOD 01)

1. Correct Option: A

Let the sum be Rs . 100 then

S.I. = Rs.(100 x 5 x 2/100)= Rs. 10

C.I = Rs. [{100 x (1 + 5/100)2} - 100] = Rs. 41/4

∴ Difference between C.I and S.I = Rs. (41/4 - 10) = Re. 0.25

⇒ 0.25 : 150 : : 100 : P

∴ P = (1.50 x 100) / 0.25 = Rs. 600

2. Correct Option: C

Let the principle is P

so compound interest = p x (1 + (12.5/100))sup>2 - p = 170

⇒ p x (112.5/100) x (112.5/100) - p = 170

⇒ P [12656.25 - 10000] = 170 x 10000

∴ p = (170 x 10000) / 2656.25

Simple interest SI = (P x T x R)/100

= [{(170 x 10000) / 2656.25} x 2 x 12.5] / 100

= 160

3. Correct Option: B

Let the sum be P.

Then, 1352 = P(1 +4/100)2

⇒ 1352 = P x 26/25 x 26/25

⇒ P = (1352 x 25 x 25) / (26 x 26) = 1250

∴ Principal = Rs. 1250

4. Correct Option: B

Let time be t years

∵ 882 = 800(1 +5/1000)t

⇒ 882/800 = (21/20)t

⇒ (21/20)2 = (21/20)t

⇒ t =2

∴ Time = 2years

5. Correct Option: C

∵ Final Amount = Rs.[2800 x (1 + 10/100) x (1 +5/100)]

= Rs. [2800 x 11/10 x 21/20]

= Rs. 3234

∴ Required C.I. = Rs.(3234 - 2800) = Rs .434

6. Correct Option: D

Amount = Rs. 7500(1 + 4/100)2

= Rs. 7500 x 26/25 x 26/25

= Rs .8112

7. Correct Option: C

Let P be the principle and R% per annum be rate

Then, P(1 +R/100)3 = 3149.28 .....(i)

and P(1 + R/100)2 = 2916 .....(ii)

on dividing(i) and (ii) we get

∴ (1 + R/100) = 3149.28/2916

⇒ R/100 = 233.28/2916

⇒ R = 233.28/2916 x 100 = 8%

Now, P(1 + 8/100)2 = 2916

⇒ P x 27/25 x 27/25 = 2916

∴ P = (2916 x 25 x 25)/(27 x 27)

= Rs. 2500

8. Correct Option: A

Let the principal be P and rate be r%.Then

$2P = P(1 + r/100)^5$

$\Rightarrow (1 + r/100)^5 = 2$

Let it be 8 times in t years, then

$\because 8P = P(1 + r/100)^t$

$\Rightarrow (1 + r/100)^t = 8$

$\Rightarrow (2)3 \Rightarrow (1 + r/100)^{15}$

$\therefore t = 15$ year.

9. Correct Option: D

Let the principal be P. Then,

$\because P(1 + 10/100)^2 - P = 420$

$\Rightarrow P(121 - 100/100) = 420$

$\Rightarrow$ P = Rs. 2000

$\therefore$ Requared S.I.= Rs.(2000 x 2 x 10)/100

= Rs. 400

10. Correct Option: A

$1600(1 + 5/100)^t = 1944.81$

$\Rightarrow (21/20)^t = 194481/160000 = (441/400)^2 = (21/20)^4$

$\therefore$ T = 4(half years)

$\Rightarrow$ Required time =2 years

11. Correct Option: C

Compound interest = $P\{(1 + r/100)^t - 1\}$

$= 10105\{(1 + 10/100)^3 - 1\}$

$= 10105\{(11/10)^3 - 1\}$

$= 10105\{1331/1000 - 1\}$

$= 10105(331/1000)$

= 3344.755

= Rs. 3300(app.)

12. Correct Option: B

From question it is clear that the simple interest of rupees 225 for one year is 238.50 - 225.

So Rate = (simple interest x 100)/(time x principle)

$= \{(238.50 - 225) \times 100\}/(225 \times 1)\ \% = 6\%$

13. Correct Option: A

For the quarterly interest,

Time = (6/12) year x 4 = 2 quarterly

Rate = 20/4 = 5%

($\therefore$ On quarterly interest time is multiplied by 4 and rate is divided by 4)

Hence,required amount = Principal $(1 + \text{Rate}/100)^{\text{Time}}$

$= 2000(1 + 5/10)^2$

$= 2000(21/20)^2$

= Rs. 2205

14. Correct Option: B

Since Interest accumulates half yearly so effective rate = R/2 = 4/2 = 2.

And effective time is 2t.

$\because 6250[1 + 2/100]^{2t} = 6632.55$

$\Rightarrow (1 + 2/100)^{2t} = 663255/625000 = 132651/125000 = (51/50)^3$

$\Rightarrow (51/50)^{2t} = (51/50)^3$

⇒ 2t =3

∴ t = 3/2 years

15. Correct Option: A

Effective annual rate = $100(1 + \{(4/4) /100\})^4 - 100$

= $(101/100)^4 \times 100 - 100$

= 104.0604 - 100

= 4.0604%

16. Correct Option: B

∵ $P(1 + r/100)^t = A$

⇒ $390625(1 + 4/100)^t = 456976$

⇒ $(1 + 4/100)^t = 456976/390625 = (26/25)^4$

⇒ $(26/25)^t = (26/25)^4$

⇒ t = 4

∴ The required time is 4 years.

17. Correct Option: C

The amount of Rs. 100 in one year at compound interest at 5% per annum payable half yearly.

= Rs. $100(1 + 5/2 /100)^2$

=Rs. $100(102.5/100)^2$

=Rs. $100(1.025)^2$

=Rs. 105.0625

Thus, the nominal rate of 5% payable half yearly has the same effect as the rate of 5.0625 per cent would have, if payable yearly.

Hence 5.0625 per cent is called the effective annual rate 5% per annum payable half yearly.

18. Correct Option: C

Let the rate be R% per annum.

Then,

$1200 \times (1 + R/100)^2 = 1348.32$

⇒ $(1 + R/100)^2 = 1348.32/1200 = 1.1236 = (1.06)^2$

⇒ $(1 + R/100) = 1.06$

⇒ R/100 = 0.06

∴ R = 6%

19. Correct Option: B

$2P = P (1 + R/100)^5$

⇒ $2^4 P = P(1 + R/100)^{20}$

⇒ The amount becomes 24 times

= 16 times and required amount = 2400 x 16 = ₹ 38400

20. Correct Option: C

Interest on ₹ 1440 = ₹ 216 for the third year

⇒ Rate percentage = (216 x 100)/(1440 x 1) = 15 %

21. Correct Option: C

Given, P = ₹ 50000, R = 12% and n = 3 Yr

According to the formula,

Amount = $P (1 + R/100)^n$

= $50000 (1 + 12/100)^3$

= 50000 x (28/25) x (28/25) x (28/25)

= 16 x (28 x 28 x 28)/ 5 = 351232/5

= ₹ 70246.40

∴ CI = 702446.40 - 50000 = ₹ 20246.40

22. Correct Option: A

Using the formula, $A = p (1 + R/100)^n$

$\Rightarrow 1352 = p(1 + 4/100)^2$

$\Rightarrow 1352 = p(1.04)^2$

$\therefore p = 1352/(1.04)^2 = ₹ 1250$

23. Correct Option: A

Given R = 4 %, n = 2 yr and A = ₹ 169.

P = ?

Amount = $P(1 + R/100)^n$

$\Rightarrow 169 = P(1 + 4/100)^2$

$\Rightarrow 169 = P(26/25)^2$

$\Rightarrow P = 169 \times (25 \times 25)/(26 \times 26)$

$\therefore P = 105625 / 676$

= ₹ 156.25

24. Correct Option: B

Given, P = ₹ 31250,

n = 9 Month = 3 quarters and

R = 16% pa = 4% per quarter

According to the formula

Amount = $P(1 + R/100)^n$

$= 31250(1 + 4/100)^3$

$= 31250 \times (26/25) \times (26/25) \times (26/25)$

= ₹ 35150

$\therefore$ CI = 35152 - 31250

= ₹ 3902

25. Correct Option: B

Let required amount be ₹ P.

According to the question,

$2916 = P (1 + R/100)^2$ ... (i)

and $3149.28 = P(1 + R/100)^3$ ... (ii)

On dividing Eq. (ii) by Eq. (i), we get

$1 + R/100 = 3149.28/2916$

$\Rightarrow R/100 = (3149.28/2916) - 1$

$\Rightarrow R = (233.28/2916) \times 100 = 8\%$

From Eq. (i),

$P = (2916 \times 100 \times 100)/(108 \times 108)$

= ₹ 2500

26. Correct Option: C

We can find required answer with the help of given formula ,

$$A = P\left(1 + \frac{r_1}{100}\right)\left(1 + \frac{r_2}{100}\right)\left(1 + \frac{r_3}{100}\right)$$

Here, P = ₹ 5000 , $r_1 7 = 4\%$, $r_2 = 5\%$, $r_3 = 10\%$

$$A = 5000\left(1 + \frac{4}{100}\right)\left(1 + \frac{5}{100}\right)\left(1 + \frac{10}{100}\right)$$

$$A = 5000 \times \frac{26}{25} \times \frac{21}{20} \times \frac{11}{10}$$

A = ₹ 6006.

27. Correct Option: A

Let the sum be ₹ P.

Here , R = 10% per annum , Time = 2 years

When compounded yearly,

$$\text{amount} = P\left[1+\frac{10}{100}\right]^2 = \frac{121}{100}P$$

When compounded half-yearly,

$$\text{amount} = P\left[1+\frac{5}{100}\right]^4 = \frac{194481}{160000}P$$

So, Given difference = ₹ 220.25

$$\Rightarrow\left[\frac{194481}{160000}-\frac{121}{100}\right]P = 220.25$$

$$\Rightarrow\frac{194481-193600}{160000}P = 220.25$$

$$\Rightarrow\frac{881}{160000}P = 220.25$$

$$\Rightarrow P = \frac{160000}{881}\times 220.25 = ₹\ 40{,}000.$$

28. Correct Option: D

Given in question , Rate = 5% per annum

For A, time = 5 years

For B, time = 3 years

r = 5% per annum

According to question ,

$$A\left(1+\frac{5}{100}\right)^5 = B\left(1+\frac{5}{100}\right)^3$$

$$\frac{B}{A} = \left(1+\frac{5}{100}\right)^2$$

$$\frac{B}{A} = \frac{441}{400}$$

Sum of ratio = 400 + 441 = 841

As given, sum = A + B = ₹ 1682

$$\text{So, } A = \frac{400}{841}\times 1682 = ₹\ 800$$

$$\text{and } B = \frac{441}{841}\times 1682 = ₹\ 882$$

29. Correct Option: C

Let the first part be p and the second part q.

$$\text{The first part after 10 years} = p\left[1+\frac{20}{100}\right]^{10}$$

$$\text{The second part after 7 years} = q\left[1+\frac{20}{100}\right]^{7}$$

As given in the problem these two amounts are equal.

So,

$$q\left(1+\frac{20}{100}\right)^7 = p\left(1+\frac{20}{100}\right)^{10}$$

$$\Rightarrow\frac{q}{p} = \left(1+\frac{20}{100}\right)^3$$

$$\Rightarrow\frac{q}{p} = \frac{216}{125}$$

and we have p + q = ₹ 10230

Using the ratio formula

$$q = \frac{216}{216+125}\times 10230 = ₹\ 6480$$

$$p = \frac{125}{216+125}\times 10230 = ₹\ 3750$$

30. Correct Option: B

Let Principal = P , Rate = r% p.a.

Here , A1 = ₹ 9680 , t1 = 2 years , A2 = ₹ 10648 , t2 = 3 years

Interest on ₹ 9680 for 1 year = 10648 – 9680 = ₹ 968

$$r = \frac{968\times 100}{9680} = 10\%$$

Using the given formula,

$$A = P\left(1 + \frac{r}{100}\right)^t$$

we get ,

$$9680 = P\left(1 + \frac{10}{100}\right)^2 = P\left(\frac{11}{10}\right)^2$$

$$\Rightarrow\ P = 9680 \times \frac{10}{11} \times \frac{10}{11} = 8000$$

$\therefore$ Principal = ₹ 8000.

31. Correct Option: A

Let the sum be ₹ P and rate = r%

Here , t = 3 years

$$SI = \frac{Pr \times 3}{100} = \frac{3\ Pr}{100}$$

$$C.I. = P\left[\left(1 + \frac{r}{100}\right)^3 - 1\right]$$

$$CI = P\left[1 + \frac{r^3}{100^3} + \frac{3r^2}{100^2} + \frac{3r}{100} - 1\right]$$

$$CI = P\left[\frac{r^3}{100^3} + \frac{3r^2}{100^2} + \frac{3r}{100}\right]$$

$$\Rightarrow\ CI - SI\ (D) = P\left[\frac{r^3}{100^3} + \frac{3r^2}{100^2} + \frac{3r}{100}\right] - \frac{3Pr}{100}$$

$$D = P\left[\frac{r^3}{100^3} + \frac{3r^2}{100^2}\right]$$

$$D = P\left(\frac{r^2}{100^3}\right)[r + 300]$$

$$P = \frac{D\ (100)^3}{r^2(r + 300)}$$

Given Here, D = ₹ 608 and r = 4% per annum

$$P = \frac{608 \times 100 \times 100 \times 100}{4 \times 4 \times (4 + 300)}$$

P = Rs. 1,25,000.

32. Correct Option: D

Let the sum be ₹ P

$$SI = \frac{Pr \times 2}{100} = \frac{2\ Pr}{100}$$

$$C.I. = P\left[\left(1 + \frac{r}{100}\right)^2 - 1\right]$$

$$= P\left[1 + \frac{r^2}{(100)^2} + \frac{2r}{100} - 1\right]$$

$$CI = P\left[\frac{r^2}{100^2} + \frac{2r}{100}\right]$$

$$CI - SI = P\left[\frac{r^2}{100^2} + \frac{2r}{100}\right] - \frac{2Pr}{100}$$

Let, CI – SI = y

$$y = \frac{Pr^2}{100^2} \Rightarrow P = y\left(\frac{100}{r}\right)^2$$

Here, y = ₹ 25 , r = 4% per annum

$$P = 25\left(\frac{100}{4}\right)^2$$

$P = 25 \times 625$

P = ₹ 15625.

33. Correct Option: C

Here , CI = ₹ 55 , SI = ₹ 50

The difference between CI and SI for 2 years period is because CI also includes interest for the second year on the first year's interest.

CI – SI = ₹ (55 – 50) = ₹ 5

$$\text{First year's SI} = \frac{50}{2} = ₹\ 25$$

So, ₹ 5 is the interest on ₹ 25 for 1 year.

$$r = \frac{100 \times I}{P \times t}$$

Here, I = ₹ 5 , P = ₹ 25 , t = 1 year

$$\therefore r = \frac{100 \times 5}{25 \times 1}$$

r = 20% per annum.

$$\text{Now, } P = \frac{100 \times I}{r \times t}$$

Here, SI = ₹ 50 , r = 20% per annum , t = 2 years.

$$P = \frac{100 \times 50}{20 \times 2}$$

P = ₹ 125.

Note : Derivation for 2 years problems :

We can find required answer with the help of given formula ,

$$\text{Rate} = \frac{2 \times (CI - SI)}{SI} \times 100$$

$$\text{Sum} = \frac{SI \times 100}{\text{Rate} \times 2}$$

34. Correct Option: B

Given that , CI = ₹ 2522 , r = 5% , t = 3 years

We can find required answer with the help of given formula ,

$$SI = CI \times \frac{rt}{100\left[\left(1 + \frac{r}{100}\right)^t - 1\right]}$$

$$SI = \frac{2522 \times 5 \times 3}{100\left[\left(1 + \frac{5}{100}\right)^3 - 1\right]}$$

$$SI = \frac{2522 \times 5 \times 3}{100\left[\frac{9261}{8000} - 1\right]}$$

$$\therefore SI = \frac{2522 \times 5 \times 3}{100 \times 1261} \times 8000 = ₹\ 2400.$$

35. Correct Option: A

Given in question , SI = ₹ 125 , r = 4% , t = 2 years

Using the given formula ,

$$\frac{CI}{SI} = \frac{100\left[\left(1 + \frac{r}{100}\right)^t - 1\right]}{rt}$$

$$= \frac{100\left[\left(1 + \frac{4}{100}\right)^2 - 1\right]}{4 \times 2}$$

$$= \frac{100 \times \left(\frac{676}{625} - 1\right)}{4 \times 2}$$

$$\frac{CI}{125} = \frac{100 \times 51}{4 \times 2 \times 625}$$

$$CI = \frac{100 \times 51 \times 125}{4 \times 2 \times 625} = ₹\ 127.5.$$

36. Correct Option: C

Here , A = ₹ 17576 , P = ₹ 15625 , r = 4% per annum

We can find required answer with the help of given formula ,

$$A = P\left(1 + \frac{r}{100}\right)^t$$

$$\Rightarrow \left(1+\frac{r}{100}\right)^t=\frac{A}{P}$$

$$\Rightarrow \left(1+\frac{4}{100}\right)^t=\frac{17576}{15625}$$

$$\left(\frac{26}{25}\right)^t=\frac{17576}{15625}=\left(\frac{26}{25}\right)^3$$

Equating powers on both sides , we get
$\therefore$ t = 3 years.

37. Correct Option: B

Given that , Rate (r) = 4% , Time (t) = 2 years

Using the given formula ,

$$SI/CI=\frac{rt}{100\left[\left(1+\frac{r}{100}\right)^t-1\right]}$$

$$\text{Required ratio}=\frac{4\times 2}{100\left[\left(1+\frac{4}{100}\right)^2-1\right]}$$

$$\text{Required ratio}=\frac{2}{25\left(\frac{676}{625}-1\right)}$$

;

$$\text{Required ratio}=\frac{2\times 625}{25\times 51}$$

$$\frac{SI}{CI}=\frac{50}{51}=50:51$$

38. Correct Option: A

Here, A = ₹ 9261 , r = 5% per annum , t = 3 years

We can find required answer with the help of given formula ,

$$P=\frac{A}{\left(1+\frac{r}{100}\right)^t}$$

$$P=\frac{9261}{\left(1+\frac{5}{100}\right)^3}$$

$$P=\frac{9261}{\frac{9261}{8000}}$$

P = ₹ 8000.

39. Correct Option: D

Given in question , Principal (P) = ₹ 10,000 , Rate (r)= 10% , Time = 3.5 years

$$A=P\left(1+\frac{r}{100}\right)^3=\left(1+\frac{r/2}{100}\right)$$

$$A=10{,}000\left(1+\frac{10}{100}\right)^3=\left(1+\frac{5}{100}\right)$$

$$A=10{,}000\times\frac{1331}{1000}\times\frac{21}{20}$$

A = ₹ 13975.5
Compound Interest (CI) = Amount (A) - Principal (P)
CI = ₹ (13975.5 – 10,000)
$\therefore$ CI = ₹ 3975.5

40. Correct Option: A

Using the given formula ,

$$A=P\left(1+\frac{r}{200}\right)^{2t}$$

Interest is compounded half-yearly ,
Here, P = ₹ 5000 , r = 10% per annum , t = 2 years

So, $A = 5000\left(1+\frac{10}{200}\right)^4$

$A = 5000\left(1+\frac{5}{100}\right)^4$

$A = 5000 \times \frac{194481}{160000} = \frac{194481}{32}$

A = ₹ 6077.5
∴ CI = A - P
CI = ₹ (6077.5 – 5000) = ₹ 1077.5.