

## Compound Interest (LOD 02)

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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. The simple interest on a certain sum for 2 years at 10% per annum is Rs.90. The corresponding compound interest is?

- a) Rs. 99                      b) Rs. 95.60  
c) Rs. 94.50                d) Rs. 108

3. What is the principle amount which earns Rs. 132 as compound interest for the second years at 10% per annum ?

- a) Rs. 1000                      b) Rs. 1200
- c) Rs. 1320                      d) None of these

4. Simple interest on a sum at 4% per annum for 2 years is Rs.80. The compound interest on the same sum for the same period is ?

- a) Rs. 81.60                      b) Rs. 160
- c) Rs. 1081.60                  d) None of these

**5.** The least number of complete years in which a sum of money put out at 20% compound interest will be more than doubled is ?

- a) 3 years                      b) 4 years  
c) 5 years                      d) 6 years

**6.** A sum of money amounts to Rs. 10648 in 3 years and Rs. 9680 in 2 years. The rate of interest is ?

- a) 5%                      b) 10%
- c) 15%                     d) 20%

7. A sum is invested at compound interest payable annually. The interest in two successive years was Rs. 500 and Rs. 540. The sum is ?

- a) Rs. 3750                      b) Rs. 5000  
c) Rs. 5600                      d) Rs. 6250

8. The difference between simple interest and compound interest at the same rate for Rs. 5000 for 2 years is Rs. 72. The rate of interest is ?

- a) 10%                      b) 12%
- c) 6%                        d) 8%

9. A sum of money becomes Rs. 6690 after three years and Rs. 10035 after six years on compound interest. The sum is ?

- a) Rs. 4400                      b) Rs. 4445  
c) Rs. 4460                      d) Rs. 4520

**10.** What will be the compound interest of Rs. 8000 at 10% p.a. for  $11\frac{1}{2}$  years. When compound interest is payable half yearly ?

- a) Rs. 1261                      b) Rs. 1385  
c) Rs. 1480                      d) Rs. 1255

11. If the interest of a certain sum for the first year at 8% p.a. compound interest is Rs. 48. What will be the interest for the second years ?

- a) Rs. 52.55                      b) Rs. 51.84  
c) Rs. 58.60                      d) Rs. 53.04

**12.** If the compound interest of a certain sum of money for 2 years at 5 % p.a. is Rs. 328. what will be the simple interest on the same time and at the same rate ?

- a) Rs. 320                      b) Rs. 322  
c) Rs. 325                      d) Rs. 326

**13.** Find the least number of complete years in which a sum of money put out at 20 percent compound interest will be more than doubled ?

- a) 2 years                      b) 3 years
- c) 4 years                      d) Data inadequate

14. A sum of money put out at compound interest amounts in 2 years to Rs. 578.40 and in 3 years to Rs. 614.55. Find the rate of interest ?

- a) 6%                      b)  $6\frac{1}{4}\%$   
c)  $6\frac{1}{2}\%$                   d)  $6\frac{3}{4}\%$

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**15.** The difference between simple interest and compound interest on Rs. 600 for 1 years at 10% per annum, reckoned half yearly is ?

- a) Nil                                      b) Rs. 6.60
- c) Rs. 4.40                                d) Rs. 1.50

**16.** The value of a machine depreciates every year at the rate of 10% on its value at the beginning of that years. If the present value of the machine is Rs. 729. Its worth 3 years ago was ?

- a) Rs. 947.10                              b) Rs. 800
- c) Rs. 1000                                d) Rs. 750.87

**17.** A tree increases annually by  $\frac{1}{8}$  th of its height. By how much will it increase after 2 years, if it stands today 64 cm high ?

- a) 72 cm                                    b) 74 cm
- c) 75 cm                                    d) 81 cm

**18.** A loan was repaid in two annual instalments of Rs. 121 each. if the rate of interest be 10% per annum. compounded annually, the sum borrowed was ?

- a) Rs. 200                                    b) Rs. 210
- c) Rs. 217.80                              d) Rs. 280

**19.** A sum of Rs. 12000 deposited at compound interest becomes doubles after 5 years. After 20 years it will become ?

- a) 120000                                    b) 192000
- c) 124000                                    d) 96000

**20.** A loan was repaid in two annual instalment of ₹ 1089 each. If the rate of interest be 10% per annum compounded annually, the sum borrowed was ?

- a) ₹ 1840                                    b) ₹ 1890
- c) ₹ 1850                                    d) ₹ 1860

**21.** Vandana invested an amount of ₹ 8000 in a fixed deposit scheme for 2 yr at the rate of 5% pa compound interest. How much amount will Vandana get on maturity of the fixed deposit?

- a) ₹ 8000                                    b) ₹ 8890
- c) ₹ 8888                                    d) ₹ 8820

**22.** Raja invested ₹ 15000 at the rate of 10 % pa for 1 yr. If the interest is compound half-yearly, then find the amount received by Raja at the end of the year.

- a) ₹ 16537.50                              b) ₹ 18000
- c) ₹ 19000.50                              d) ₹ 20000

**23.** What amount will be received on a sum of ₹ 15000 in  $11\frac{1}{4}$  yr at 12% pa, if interest is compounded quarterly?

- a) ₹ 16596.88                              b) ₹ 16789.08
- c) ₹ 17630.77                              d) ₹ 17389.12

**24.** The compound interest on ₹ 30000 at 7% pa for a certain time is ₹4347. The time is

- a) 2 yr                                        b) 2.5 yr
- c) 3 yr                                        d) 4 yr

**25.** What is the difference between compound interest and simple interest for 2 yr on the sum of ₹ 1250 at 4% pa?

- a) ₹ 3                                        b) ₹ 4
- c) ₹ 2                                        d) ₹ 8

**26.** The difference between compound and simple rates of interest on ₹ 10000 for 3 yr at 5% per annum is

- a) ₹ 76.25                                    b) ₹ 76.75
- c) ₹ 76.50                                    d) ₹ 76

**27.** A borrowed sum was paid in the two annual installments of ₹ 121 each. If the rate of compound interest is 10% pa, what sum was borrowed?

- a) ₹ 217.80                                    b) ₹ 210
- c) ₹ 220                                      d) ₹ 200

**28.** If ₹ 3000 amounts to ₹4329 at compound interest in a certain time , then ₹ 3000 amounts to what in half of the time?

- a) ₹ 3400                                    b) ₹ 3600
- c) ₹ 38000                                    d) ₹ 3520

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**29.** The population of a city increases at the rate of 5% pa. If the present population of the city is 185220, then what was its population 3 yr ago?

- a) 181500                      b) 183433
- c) 160000                     d) 127783

**30.** A sum of ₹ 400 amounts to ₹ 441 in 2 yr. What will be its amount, if the rate of interest is increased by 5% ?

- a) ₹ 484                      b) ₹ 560
- c) ₹ 512                      d) ₹ 600

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1. Correct Option: A

Let the sum be Rs. 100 then,

$$\text{S.I.} = \text{Rs.}(100 \times 5 \times 2)/100 = \text{Rs.}10$$

$$\text{C.I.} = \text{Rs.}[100 \times (1 + 5/100)^2] = \text{Rs.}41/4$$

$$\therefore \text{ difference between C.I. and S.I.} = \text{Rs. } (41/4 - 10) = \text{Rs.}0.25$$

$$\Rightarrow 0.25 : 1.50 :: 100 : P$$

$$\therefore P = (1.50 \times 100) / 0.25 = \text{Rs. } 600$$

2. Correct Option: C

$$\text{Principle} = (100 \times \text{interest}) / (\text{time} \times \text{rate})$$

$$\Rightarrow \text{Sum} = (100 \times 90) / (2 \times 10) = \text{Rs. } 450$$

$$\text{C.I.} = \text{Rs.}[450 \times (1 + 10/100)^2 - 450] = \text{Rs. } 94.50$$

3. Correct Option: B

Let P the principle at the end of first year.

$$\text{Then } (P \times 10 \times 1)/100 = 132$$

$$\Rightarrow P = 1320$$

Let Q be the original principle

$$\text{Then, } Q + (Q \times 10 \times 1)/100 = 1320$$

$$\Rightarrow Q = 1200$$

4. Correct Option: A

$$\text{principle} = (\text{interest} \times 100) / (\text{time} \times \text{rate})$$

$$= \text{Rs. } (100 \times 80)/(4 \times 2) = \text{Rs. } 1000$$

$$\therefore \text{C.I.} = \text{Rs.}[\{1000 \times (1 + 4/100)^2 - 1000\}] \\ = \text{Rs. } 81.60$$

5. Correct Option: B

$$\therefore P \times (1 + 20/100)^t > 2P$$

$$\Rightarrow (6/5)^n > 2$$

$$\text{Now, } (6/5) \times (6/5) \times (6/5) \times (6/5) > 2$$

$$\Rightarrow 1296/615 > 2$$

$$\therefore t = 4 \text{ years}$$

6. Correct Option: B

Let P be the principle and R% per annum be the rate.  
Then,

$$P(1 + R/100)^3 = 10648 \dots(i)$$

$$\text{and } P(1 + R/100)^2 = 9680 \dots(ii)$$

on dividing (i) by (ii), we have

$$\Rightarrow (1 + R/100) = 10648/9680$$

$$\Rightarrow R/100 = 968/9680 = 1/10$$

$$\therefore R = 100/10 = 10\%$$

7. Correct Option: D

$$\text{S.I. on Rs. } 500 \text{ for } 1 \text{ year} = 540 - 500 = \text{Rs. } 40$$

$$\therefore \text{Rate} = (100 \times 40)/(500 \times 1) = 8\%$$

$$\text{and Sum} = \text{Rs.}(100 \times 500)/(8 \times 1) = \text{Rs. } 6250$$

8. Correct Option: B

$$\therefore [5000 \times (1 + R/100)^2 - 5000] - (5000 \times 2 \times R)/100 = 72$$

$$\Rightarrow 5000[(1 + R/100)^2 - 1 - R/50] = 72$$

$$\therefore 1 + R^2/10000 + 2R/100 - 1 - R/50 = 72/5000$$

$$\Rightarrow R^2 = (72/5000 \times 10000) = 144$$

$$\therefore R = 12\%$$

9. Correct Option: C

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Let the principal be P, then

$$P(1 + R/100)^3 = 6690$$

$$\text{And } P(1 + R/100)^6 = 10,035$$

Now, dividing (ii) by (i), we get

$$\Rightarrow (1 + R/100)^3 = 10035/6690 = 3/2$$

$$\Rightarrow P \times 3/2 = 6690$$

$$\therefore P = (6690 \times 2/3) = \text{Rs. } 4460$$

**10. Correct Option: A**

Yearly interest = 10%

Half yearly = 5%

Time =  $11/2 = (3/2) \times 2$  half yearly = 3 half yearly

$$\text{Amount} = 8000(1 + 5/100)^3$$

$$= 8000 \times (21/20)^3$$

$$= 8000 \times 21/20 \times 21/20 \times 21/20$$

$$= \text{Rs. } 9261$$

$$\text{Compound interest} = \text{Amount} - \text{Principal} = 9261 - 8000$$

$$= \text{Rs. } 1261$$

**11. Correct Option: B**

S.I. or C.I. for first year are always equal

$$\text{Principle} = (\text{S.I.} \times 100)/(\text{Rate} \times \text{Time})$$

$$= (48 \times 100)/(8 \times 1) = \text{Rs. } 600$$

$$\text{Interest for second year} = \text{Amount of second year} - \text{Amount of the first year}$$

$$= 600(1 + 8/100)^2 - 600(1 + 8/100)$$

$$= 600(27/25)^2 - 600(27/25)$$

$$= 600(27/25) \{27/25 - 1\} = 600(27/25)(2/25)$$

$$= \text{Rs. } 51.84$$

**12. Correct Option: A**

$$\therefore 328 = \text{Principal} \{(1 + 5/100)^2 - 1\}$$

$$\Rightarrow 328 = \text{Principal} (441/400 - 1)$$

$$\Rightarrow 328 = \text{Principal } 41/400$$

$$\Rightarrow \text{Principal} = (328 \times 400)/41 = \text{Rs. } 3200$$

$$\therefore \text{Simple interest} = (3200 \times 5 \times 2) / 100 = \text{Rs. } 320$$

**13. Correct Option: C**

$$\text{Here } P(1 + 20/100)^t > 2P$$

$$\Rightarrow (6/5)^t > 2$$

$$\therefore (6/5)^3 = 1.728, \text{ and}$$

$$(6/5)^4 = 2.0736$$

$$\text{By trial } (6/5) \times (6/5) \times (6/5) \times (6/5) > 2$$

$\therefore$  The required time is 4 years.

**14. Correct Option: B**

Clearly the difference between Rs. 578.40 and Rs. 614.55 is the interest on Rs. 578.40 for 1 year.

$$\therefore \text{Interest on Rs. } 578.40 \text{ for 1 year} = \text{Rs. } 614.55 - \text{Rs. } 578.40 = \text{Rs. } 36.15$$

$$\therefore \text{Interest on Rs. } 100 \text{ for 1 year} = \text{Rs. } (36.15 \times 100)/578.40$$

$$= \text{Rs. } 3615/57840 \times 100/1$$

$$= \text{Rs. } 6.25$$

$$= \text{Rs. } 6 \frac{1}{4}$$

$\therefore$  The required rate is  $6 \frac{1}{4}$  percent.

**15. Correct Option: D**

$$\text{S.I.} = \text{Rs. } (600 \times 5 \times 2)/100 = \text{Rs. } 60$$

$$\text{C.I.} = \text{Rs. } [600 \times (1 + 5/100)^2 - 600] = \text{Rs. } 61.50$$

$$\therefore \text{Required Difference} = \text{Rs. } (61.50 - 60) = \text{Rs. } 1.50$$

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**16. Correct Option: C**

$$\therefore P(1 - 10/100)^3 = 729$$

$$\therefore P = \text{Rs.}(729 \times 10 \times 10 \times 10)/(9 \times 9 \times 9) = \text{Rs. } 1000$$

**17. Correct Option: D**

$$\text{Increase}\% = (1/8) \times 100\% = 12.5\%$$

$$\text{Height after 2 years} = 64 \times \{1 + 25/(2 \times 100)\}^2$$

$$= 64 \times 9/8 \times 9/8$$

$$= 81 \text{ cm}$$

**18. Correct Option: B**

Principal = (P.W. of Rs. 121 due 1 year later) + (P.W. of Rs. 121 due 2 years later)

$$= \text{Rs. } [121 / (1 + 10/100) + (121 / (1 + 10/100)^2)]$$

$$= \text{Rs. } 210$$

**19. Correct Option: B**

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

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

$$\therefore (1 + r/100)^{20} = 2^4 = 16$$

$$\text{Thus, } P(1 + r/100)^{20} = 16P$$

$$= \text{Rs. } (12000 \times 16)$$

$$= \text{Rs. } 192000$$

**20. Correct Option: B**

$$\text{Principle} = ₹ 1089$$

$$\therefore P/\{(1 + 10/100) + (1 + 10/100)^2\} = 1089$$

$$\Rightarrow P = \{(1089 \times 10/11) + (1089 \times 100/121)\} = (990 + 900) = ₹ 1890$$

**21. Correct Option: D**

$$\text{Given, } P = ₹ 8000, R = 5\% \text{ and } n = 2 \text{ Yr}$$

According to the formula,

$$\text{Amount} = p(1 + R/100)^n$$

$$= 8000(1 + 5/100)^2$$

$$= 8000 \times (105/100)^2$$

$$= 8000 \times (21/20) \times (21/20)$$

$$= 20 \times 21 \times 21$$

$$= ₹ 8820$$

**22. Correct Option: A**

$$\text{Given } P = ₹ 15000, R = 10\%$$

$$\text{and } n = 1 \text{ yr}$$

Accounting to the formula,

$$\text{Amount} = P(1 + R/(2 \times 100))^{2n}$$

$$= 15000 \times (1 + 5/100)^2$$

$$= 15000 \times (105/100)^2$$

$$= 15000 \times (21/20) \times (21/20)$$

$$= ₹ 16537.50$$

**23. Correct Option: D**

$$\text{Given, } P = ₹ 15000, R = 12\%$$

$$\text{and } n = 11/4 = 5/4 \text{ Yr}$$

According to the formula,

$$\text{Amount} = p[1 + R/(100 \times 4)]^{4n}$$

$$= 15000 \times [1 + 12/(100 \times 4)]^{4 \times 5/4}$$

$$= 15000(412/400)^5$$

$$= 15000(103/100)^5$$

$$= 15000 \times (103/100) \times (103/100) \times (103/100) \times (103/100) \times (103/100)$$

$$= (15 \times 103 \times 103 \times 103 \times 103 \times 103) / 10000000$$

$$= ₹ 17389.111$$

$$= ₹ 17389.12 \text{ (approx)}$$

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**24. Correct Option: A**

Given, CI = ₹ 4347, P = ₹ 30000 and R = 7%

By formula,  $CI = P[(1 + R/100)^n - 1]$

$$\Rightarrow 4347 = 30000 [(1 + 7/100)^n - 1]$$

$$\Rightarrow (107/100)^n = (4347/30000) + 1$$

$$\Rightarrow (107/100)^n = 34347/30000 = 11449/10000$$

$$\Rightarrow (107/100)^n = (107/100)^2$$

$$\therefore n = 2$$

**25. Correct Option: C**

Given, P = ₹ 1250, n = 2 yr and R = 4%

According to the formula,

Difference between compound interest and simple interest =  $PR^2/100^2$

$$\therefore \text{Required difference} = (1250 \times 4 \times 4)/(100 \times 100) = ₹ 2$$

**26. Correct Option: A**

$$\text{Required difference} = P(R/100)^2 \times [(300 + R)/100]$$

$$= 10000(5/100)^2(305/100)$$

$$= 76.25$$

**27. Correct Option: B**

According to the question,

$$\text{Borrowed sum} = [121/\{1/(1 + 10/100)\}] + 121/(1 + 10/100)^2$$

$$= 121/(11/10) + 121/\{(11/10) \times (11/10)\}$$

$$= 110 + 100$$

$$= ₹ 210$$

**28. Correct Option: B**

Let rate = R% and time = n yr

$$\text{Then, } 4320 = 3000(1 + R/100)^n$$

$$\Rightarrow (1 + R/100)^n = 4320/3000 = 1.44$$

$$\therefore (1 + R/100)^{n/2} = \sqrt{1.44} = 1.2$$

$$\therefore \text{Required amount for } n/2 \text{ yr}$$

$$= 3000(1 + R/100)^{n/2}$$

$$= 3000 \times 1.2 = ₹ 3600$$

**29. Correct Option: C**

Given, P = 185220 R = 5% (increases) and n = 3 yr

According to the formula,

$$\text{Population } n \text{ yr ago} = P/(1 + R/100)^n$$

$$= 185220/(1 + 5/100)^3$$

$$= 185220/[(21/20) \times (21/20) \times (21/20)]$$

$$= [185220 \times 20 \times 20 \times 20] / [21 \times 21 \times 21]$$

$$= 20 \times 20 \times 20 \times 20$$

$$= 160000$$

**30. Correct Option: A**

According to the given condition.

$$441 = 400 (1 + R/100)^2$$

$$\Rightarrow 441/400 = (1 + R/100)^2$$

$$\Rightarrow (21/20)^2 = (1 + R/100)^2$$

$$\Rightarrow 21/20 = 1 + R/100$$

$$\Rightarrow (21/20) - 1 = R/100$$

$$\Rightarrow R/100 = 1/20$$

$$\therefore R = 5\%$$

$$\therefore \text{new rate} = 5 + 5 = 10\%$$

$$\therefore \text{Amount} = 400 (1 + 10/100)^2$$

$$= 400 \times (11/10) \times (11/10)$$

$$= ₹ 484$$