COMPUND INTEREST

1. If the compound interest accrued on an amount of Rs. 15,000 in two years is Rs. 2,496, what is the rate of interest p.c.p.a.?

    A. 8%
    B. 10%
    C. 6%
    D. Can't be determined

2. The compound interest on Rs. 10,000 in 2 years at 4% per annum, the interest being compounded yearly, is

    A. Rs. 636.80
    B. Rs. 816
    C. Rs. 912
    D. Rs. 828.82

3. A sum of money is borrowed and paid back in two annual installments of Rs. 1764 each, allowing 5% CI. What was the sum borrowed?

    A. Rs. 4000
    B. Rs. 3340
    C. Rs. 3000
    D. Rs. 3280

4. If the simple interest on a sum of money at 5% per annum for 2 years is Rs. 1400, find the compound interest on the same sum for the same period at the same rate.

    A. Rs. 1023
    B. Rs. 1435
    C. Rs. 3232
    D. Rs. 1255

5. Divide Rs. 841 between A and B, so that the amount of A after 7 years is equal to the amount of B after 9 years, the interest being compounded at 5% per annum.

    A. Rs. 441 and Rs. 400
    B. Rs. 453 and Rs. 564
    C. Rs. 321 and Rs. 583
    D. Rs. 349 and Rs. 867

6. A sum of money doubles itself at compound interest in 5 years. In how many years will it become eight times?

A. 20 years
B. 25 years
C. 30 years
D. 15 years

7. Certain sum amounts to Rs. 1,952 in two years and to Rs. 2,147.20 in 3 years at compound interest, then rate percent is:

A. 11%
B. 13%
C. 10%
D. 12%

8. Sanjay purchased a hotel worth rupees 10 lakhs and Anita purchased a car worth Rs. 16 lakh. The value of hotel every year increase by 20% of the previous value and the value of car every depreciates by 25%. What is the difference between the price of hotel and car after 3 years?

A. 10,53,000
B. 10,63,000
C. 11,53,000
D. 10,43,000

9. An amount of Rs. X at compound interest at 20% per annum for 3 year becomes y. what is y : x?

A. 3 : 1
B. 36 : 25
C. 216 : 125
D. 125 : 216

10. The difference between simple interest and compound interest on a certain sum of money for 2 years at 5% per annum is Rs. 100. Find the sum.

A. Rs. 42000
B. Rs. 45000
C. Rs. 41500
D. Rs. 40000

11. There is 90% increase in an amount in 9 years at simple interest. What will be the compound interest of Rs. 15000 after 4 years at the same rate?

A. 4533
B. 6962
C. 5497

D. 6218

12. An amount of Rs. 110000 is invested at compound interest payable annually. If the rate of interest is 11% pa, what will be the total interest after two years?

   A. Rs. 23481
   B. Rs. 25531
   C. Rs. 24200
   D. Rs. 26416

13. The simple interest accrued on a certain principal at a rate of 9% p.c.p.a. in 5 years is Rs. 14,400. What would be the compound interest accrued on the same principle in 2 years at the rate of 4 p.c.p.a. ?

   A. Rs. 2614.60
   B. Rs. 2641.60
   C. Rs. 2611.20
   D. Rs. 2624.20

14. Shivani has some amount of money and she invested the money in two schemes A and B in the ratio of 2 : 5 for 2 years, scheme A offers 30% pa compound interest and scheme B offers 15% pa Simple interest. Difference between the interest earned from both the schemes is Rs.1080. How much was invested in scheme B?

   A. Rs. 45000
   B. Rs. 36000
   C. Rs. 40000
   D. Rs. 50000

15. The compound interest on Rs 7500 in 2 years when the successive rate of interest on successive years is 8% and 10% respectively:

   A. Rs 1410
   B. Rs 7510
   C. Rs 1497
   D. Rs 1401

16. If the compound interest on a certain sum for 2 years is Rs. 636 at a 12% p.a. Find the double of the sum.

   A. Rs. 4500
   B. Rs. 2500
   C. Rs. 3000
   D. Rs. 5000

17. Amit deposited some money in a bank, which pays 15% interest per annum compounded yearly. If the bank provides simple interest instead of compound interest, he receives Rs. 2400 after 2 years. Find the total Amount that he received after 2 years.

    A. Rs. 10960

    B. Rs. 9500

    C. Rs. 10580

    D. Rs. 10500

18. A lent an amount of Rs. 1100 to B. This is to be paid back to A in two instalments. If the rate of interest, which A charges to B, be 20% compounded annually, then what is the value of each instalment?

    A. Rs. 730

    B. Rs. 780

    C. Rs. 750

    D. Rs. 720

19. Murli Vijay took money from the micro finance company Mountsoft Nidhi at lower rate of interest and saved in a scheme, which gave him a compound interest of 20%, compounded annually. Find the least number of complete years after which his sum will be more than double.

    A. 4 years

    B. 2 years

    C. 6 years

    D. 8 years

20. A sum of Rs. 9960 was borrowed at 15/2% per annum compound interest and paid back in two years in two equal annual installments. What was the amount of each installment?

    A. Rs. 5345

    B. Rs. 5547

    C. Rs. 5847

    D. Rs. 5397

21. A man gave 50% of his savings of Rs 67,280 to his wife and divided the remaining sum between his two sons A and B of 14 and 12 years of age respectively. He divided it in such a way that each of his sons, when they attain the age of 18 years, would receive the same amount at 5% compound interest per annum. The share of B was

    A. 16500

    B. 15000

    C. 15020

D. 16000

22. If the compound interest on certain sum at 4% for 2 years is Rs. 2448. Find the simple interest on the same sum at the same rate for the same period.

   A. 2500
   B. 2400
   C. 2436
   D. 2420

23. A man saves Rs.20,000 at the beginning of each year and puts the money in a bank that pays 10% interest per year, interest being compounded annually. What would be the total savings of the man at the end of 6 years?

   A. Rs. 196840
   B. Rs. 169840
   C. Rs. 189480
   D. Rs. 199480

24. A man takes a loan of Rs 216000 from a bank, to be returned in three years at a rate of 16.67% p.a. compound interest. The man returns Rs 84000 and Rs 58000 after first and second year. How much money will he have to return after third year to settle the loan?

   A. Rs. 161000
   B. Rs. 138000
   C. Rs. 152000
   D. Rs. 175000

25. Shyam deposited Rs. 80000 in a bank which pays 10% compound interest for 2 years. Then after 2 years, he started a business with amount (sum + interest) along with Ram, with capital of Rs. 60,000. Shyam invested for 6 months and left. Ram invested for the whole year. What will be the ratio of their profits at the end of the year?

   A. 150 : 221
   B. 121 : 150
   C. 121 : 130
   D. 130 : 121

Answers:

1. A

Solution: Principal (P) = Rs. 15000; CI = Rs. 2496; Time (t) = 2 years.

Let the rate be R% per annum. then,

CI = [P(1 + R/100)^t – 1]

Or

$\Rightarrow$ 2496 = 15000[(1 + R/100)^2 – 1]

$\Rightarrow$ 2496/15000 + 1 = (1 + R/100)^2

$\Rightarrow$ 17496/15000 = (1 + R/100)^2

$\Rightarrow$ 729/625 = (1 + R/100)^2

By comparing,

$\Rightarrow$ (27/25)^2 = (1 + R/100)^2

$\Rightarrow$ 27/25 = 1 + R/100

$\Rightarrow$ R = (27/25 – 1) × 100 $\Rightarrow$ R = 8%

2. B

Solution: Rate of interest = 4%

Therefore, applying the net% effect formula for effective rate of compound interest for 2 years , we get

Net% effect = x + y + xy/100 %

x = y = 4%

= 4 + 4 + (4 × 4)/100 = 8 + .16 = 8.16%

CI = 8.16% of 10,000

= (8.16 × 10000)/100

= Rs. 816

3. D

Solution: According to the question,

$\Rightarrow$ Borrowed sum = 1764/(1 + 5/100) + 1764(1 + 5/100)^2

From formula, A = P(1 + R/100)^n

$\Rightarrow$ P = A/(1 + R/100)^n

$\Rightarrow$ 1764/(21/20) + 1764/(21/20)^2

⇒ 1764 × 20/21 + 1764 × 400/441

 ⇒ 84 × 20 + 4 × 400 = 1680 + 1600 = Rs. 3280

4. B

Solution: We know, that

SI = rt% (rate of interest & time) and by the net% effect we would calculate the effective compound rate of interest for 2 years = 10.25% (Refer to sub-details)

1400 = (2 × 5)%

So, 10% ≡ Rs. 1400

10.25% ≡ Rs. x

By the cross multiplication, we get

x = 1400 × 10.25/10

= Rs. 1435.

5. A

Solution: Let the two parts be Rs. x and Rs. (841 – x).

$x (1 + 5/100)^7$

$= (841 – x)(1 + 5/100)^9$

⇒ $x/(841 – x) = (1 + 5/100)^2$

= (21/20) × (21/20).

⇒ 400x = 441 (841 – x)

⇒ 841x = 441 × 841

⇒ x = 441.

So, the two parts are Rs. 441 and Rs. (841 – 441) i.e Rs. 441 and Rs. 400.

6. D

Solution: $P(1 + R/100)^5 = 2P ⇒ (1 + R/100)^5 = 2P/P = 2$ ...(i)

Let $P(1 + R/100)^n = 8P$

100

⇒ $(1 + R/100)^n$

= 8 = 23

= $\{(1 + R/100)^5\}^3$

[using (i)]

⇒ $(1 + R/100)^n$

= $(1 + R/100)^{15}$

⇒ n = 15.

Thus, the required time = 15 years.

7. C

Solution: Difference between the amount of 2 yr and 3 yr = 2147.20 – 1952 = 195.20

Now, this sum of Rs. 195.20 is earned as an interest on Rs. 1952 (2 years' SI) taken as principal.

Therefore, the reqd. rate % = (195.20/1952) × 100 = 10%.

8. A

Solution: Amount of the hotel after 3 years = 10 lakh $(1 + 20/100)^3$

= 10 lakh $(6/5)^3$

= 10,00,000 × (216/125)

⇒ 1728000.

Amount of the car after 3 years =16 lakh (1 – 25/100)

= 16 lakh (3/4)

= 16,00,000 × 27/64

= 6,75,000.

Difference = 17,28,000 – 6,75,000 = 10,53,000.

9. C

Solution: Let P = Rs. x, r = 20%, t = 3 year, A = Rs. y

∵ A = $P(1 + r/100)^t$

⇒ y = x $(1 + 20/100)^3$

⇒ y = x $(6/5)^3$

$\Rightarrow y/x = (6/5)^3$

$= 216/125$

$\therefore y : x = 216 : 125.$

10. D

Solution: To solve this question, we can apply a short trick approach

Sum = Difference × 100^2 / r^2

Given, Difference = Rs. 100, r = 5%

By the short trick approach, we get

Sum = 100 × 100^2 / 5^2

= Rs. 40000

11. B

Solution: Since increase in interest in 9 years = 60%

Therefore, increase in interest in 1 year = 10% (Rate of interest)

Now, P = 15000, T = 4 years & R = 10% p.a.

By the net% effect we would calculate the effective compound rate of interest for 4 years = 46.41% (Refer to sub-details)

Therefore, CI = 46.41% of 15000

CI = (46.41 × 15000)/100

= 6961.5 ≈ 6962

12. B

Solution: P = Rs. 110000; R = 11%; n = 2 years

CI = P $(1 + R/100)^n$ – P

CI = 110000 $(1 + 11/100)^2$ – 110000

= 110000 $(111/100)^2$ – 110000

= 135531 – 110000 = Rs. 25531

13. C

Solution: SI for 5 years at the rate of 9% = 5 × 9 = 45%

CI for 2 years at the rate of 4%, applying the net% effect

= 4 + 4 + (4 × 4)/100 = 8.16%

45% ≡ Rs. 14400

So, 8.16% ≡ Rs. x

By cross multiplication, we get

x = 14400 × 8.16 / 45

= Rs. 2611.20

14. A

Solution: Let the amount invested in scheme A is 2 × 50 = 100, the amount invested in scheme B is 5 × 50 = 250

Interest from scheme A = $100 × (1 + 30/100)^2$

= 169 – 100 = Rs.69

Interest from scheme B = 250 × 15% × 2

= Rs.75

Difference between interest = 75 – 69 = Rs.6

If the difference is Rs. 6, investment in scheme B = Rs.250

so the difference is Rs.1080,

investment in scheme B =Rs. 250/6 × 1080. = Rs.45000

15. A

Solution: Amount at the end of 2nd year

= Rs7500 (1 + 8/100) (1 + 10/100)

= Rs 7500 × 1.08 × 1.10

= Rs 8910

Thus C.I. for two years = amount – principal

= Rs 8910 – Rs 7500 = Rs 1410

16. D

Solution: Compound Interest = $P (1 + 12/100)^2 – P$

100

636 = P (1 + 12/100)2 – P

636 = P (1 + 3/25)2 – P

636 = P (28/25)2 – P

636 = 784P/625 – P

636 = 159P/625

636 × 625/159 = P

P = 2500 Rs

Double of the sum = 2500 × 2 = 5000 Rs.

17. C

Solution: S.I = P × R × T / 100

2400 = P × 15 × 2 / 100

P = Rs 8000

A = P(1 + r/100)²

A = 8000 (1 + 15/100)²

A = 8000 (115/100 × 15/100)

A = Rs. 10580

18. D

Solution: Let x = equal instalment at the end of each year

Now 1st year,

P = Rs. 1100

Interest at the end of 1st year = 1100 × 20 × 1 / 100 = Rs. 220

Now, at the beginning of 2nd year,

P = Rs. (1100 + 220 – x) = Rs. (1320 – x)

Interest at the end of 2nd year = (1320 – x) × 20 × 1 / 100

= 264 – x/5

Now amount remaining after 2 years = (1320 – x) + (264 – x/5) – x = 0

⇒ 2x + x/5 = 1320 + 264

⇒ 11x/5 = 1584

⇒ X = 720

19. A

Solution: To solve such questions, we can apply the net% effect

x + y + xy/100 %

For first 2 years, the amount will be increased by

x = y = 20%

= 20 + 20 + 20 × 20/100 = 40 + 4 = 44%

For 3rd year,

x = 44%, y = 20%

= 44 + 20 + 44 × 20/100 = 64 + 8.8 = 72.8%

For 4th year,

x = 72.8, y = 20%

= 72.8 + 20 + 72.8 × 20/100 = 92.8 + 14.56 = 107.36%

Hence, it will take minimum 4 years to make sum more than double.

20. B

Solution: Let the each instalment be x.

x/(1 + 15 / 2 × 100) + x/(1 + 15 / 2 × 100)² = 9960

x/(1 + 3 / 40) + x/(1 + 3 / 40)² = 9960

⇒ 40x/43 + 1600x/1849 = 9960

⇒ (1720 x + 1600 x) / 1849 = 9960

⇒ 3320 x = 9960 × 1849 ⇒ x = Rs. 5547

21. D

Solution: Total Income = 67,280

After giving 50% salary to his wife the man is left with an amount = 33,640

Let's assume the man gave Rs. x to A. Therefore B will get Rs. (33640 – x).

33640

↙   ↘

14 years A   12 years B

x   (33640 – x)

Now, as per the question A & B will be getting an equal amount with CI at 5% rate per year at the 18th year.

$\Rightarrow x(1 + 5/100)^4 = (33640 – x)[1+ 5/100]^6$

$\Rightarrow x/(33640 – x) = (1 + 5/100)^6 / (1 + 5/100)^4$

$\Rightarrow x/(33640 – x) = (21/20 \times 21/20)$

$\Rightarrow 400 x = 33640 \times 441 – 441x$

$\Rightarrow 841x = 33640 \times 441$

$x = 33640 \times 441 / 841 = 40 \times 441 = 17640/-$

Therefore, at the time of division of money, B would have got a sum = (33640 – 17640) = Rs. 16000

22. B

Solution: Let the sum be Rs. x, then,

$C.I = [x \times (1 + 4/100)^2 – x] = (676x/625 – x) = 51x/625$

So,

$51x/625 = 2448$ or $x =2448 \times 625/51 = 30000$.

Thus, the sum is Rs. 30000.

So, $S.I = Rs (30000 \times 4 \times 2 \times 1/100) = Rs 2400$.

23. B

Solution: The first Rs. 20000 would become $20000(1.1)^6$ after 6 years, the second will become $20000(1.1)^5$. the third will become $20000 (1.1)^4$, the fourth will become $20000 (1.1)^3$, the fifth will become $20000(1.1)^2$ and the sixth will become $20000 (1.1)$.

Total amount = $20000 [(1.1) + (1.1)^2 + (1.1)^3 + (1.1)^4 + (1.1)^5 + (1.1)^6]$

= $(20000) (1.1) [1 + (1.1) + (1.1)^2 + (1.1)^3 + (1.1)^4 + (1.1)^5]$

= $22000 \{(1.1)^6 – 1\} / (1.1-1)$

= 22000 (7.72) = Rs. 169840

24. A

Solution: Money took = Rs 216000

Amount after first year

= 216000 × (1 + 16.67/100) = 216000 × 7/6

= 252000

Amount paid after first year = 84000, amount remaining = 252000 – 84000 = 168000

Amount to be paid after second year

= 7/6 × 168000 = 196000

Amount paid after second year = 58000, amount remaining = 196000 – 58000 = 138000

Amount to paid after third year

= 7/6 × 138000 = Rs 161000

25. B

Solution: Capital of Shyam = Rs. 80,000

Rate of Interest = 10%

Time for which he deposited in bank = 2 years

Amount = $80000 (1 + 10/100)^2$

Amount = 80000 × 121/100 = Rs. 96800

Investment of Shyam in business = Rs. 96800

Investment of Ram in business = Rs. 60000

Ratio of their profits = 96800 × 6 / 60000 × 12

Ratio = 968 : 1200 = 121 : 150