



SI and CI questions for CAT Set-2 PDF

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Instructions

For the following questions answer them individually

Question 1

On a sum of money, the difference between simple interest and compound interest for 2 years is Rs. 1000. If the rate of interest is 10% p.a., what will be the difference between simple interest and compound interest at the end of 3 years?

- A 4200
- B 3000
- C 3100
- D Can't be determined

Answer: C

Explanation:

Let principal be P. SI for 2 years = $P \times 2 \times 10/100 = P/5$. CI for 2 years = $P(1 + 10/100)^2 - P = 21P/100$. Therefore, difference in interest amount = $P/100 = 1000 \Rightarrow P = 1,00,000$. SI for 3 years = 30000. CI for 3 years = 33100. Difference = 3100.

Question 2

The difference between compound interest and simple interest on a sum of Rs. 5000 at the end of 3 years is Rs 224.64. Find the rate of interest, if both simple interest and compound interest are calculated at the same rate of interest.

- A 12%
- B 10%
- C 8%
- D 15%

Answer: A

Explanation:

When the rate of interest is 12%, SI = $5000 \times 3 \times 12/100$

In the case of compound interest, Amount = $P(1 + r)^n$

$$CI = \text{Amount} - P = P(1 + r)^n - P$$

$$CI = 5000(1 + 12/100)^3 - 5000$$

$$CI - SI = 5000(1 + 12/100)^3 - 5000 - 5000 \times 3 \times 12/100 = 224.64$$

Question 3

On a sum of money, the simple interest (rate of interest r)for 2 years is the same as compound interest (rate of interest R). What is the relation between the rates of interest?

- A $R + 100 = \sqrt{10000 + 200r}$
- B $R - 100 = \sqrt{10000 - 200r}$
- C None of the above
- D Can't be determined

Answer: A

Explanation:

$$SI = p * 2 * r/100$$

$$CI = p * (1 + R/100)^2 - p = p(2R/100 + (R/100)^2)$$

Since they are equal, $p * 2 * r/100 = p(2R/100 + (R/100)^2)$

$$R^2 + 200R - 200r = 0$$

Solving the equation, we get $R = -100 \pm \sqrt{10000 + 200r}$

Since, R cannot be negative the only possible value of $R = -100 + \sqrt{10000 + 200r}$

$$\Rightarrow R + 100 = \sqrt{10000 + 200r}$$

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Question 4

A certain amount is given at compound interest and the amount increased by 27% between the 2nd year and 4th year. After how many years does the amount double itself?

- A 8 years
- B 7 years
- C 6 years
- D Can't be determined

Answer: C

Explanation:

The ratio of the amounts at the end of the 2nd and 4th years is $(1 + R)^2 = 1.27$

After 6 years, the ratio is $(1 + R)^6 = 2.05$

It can be seen that $(1 + R)^5 < 2$

So, the amount doubles every 6 years

Question 5

Mohan borrowed 10000 rupees from Sohan. Sohan charges a simple interest of 10 pa. Mohan returned 4000 Rs after 1 year which included the interest for the first year. He returned the remaining amount after 2 more years. What is the interest that Mohan ended up paying?

- A 2000
- B 2400
- C 2500
- D 3000

Answer: B

Explanation:

Principal for first year = 10000, So interest for first year would be $10000 * 10/100 = 1000$

Now for the remaining two years, the principal would be 7000, so interest that he will pay in 2 years = $7000 * 2 * 10/100 = 1400$

Thus, the total interest that he ends up paying is $1400 + 1000 = 2400$

Question 6

Ravi invests a sum of money in a bank which gives a simple interest of 5% p.a. He invests twice the amount of money in another bank which gives a interest of 3% pa compounded annually. At the end of 3 years the interest earned from which bank would be higher and by what percent(approx)?

- A 1st, 25%
- B 2nd, 10%
- C 2nd, 24%
- D 1st, 15%

Answer: C

Explanation:

Let the amount invested in first bank be x

So interest earned in 3 years $= x \cdot 5 \cdot 3 / 100 = .15x$

Now amount invested in second scheme is $2x$

So the amount after 3 years would be

$$(1.03)^3 \cdot 2x = 2.185x$$

So the interest earned $= .185x$

Thus the interest earned in second case is 24% more than the interest earned in first case.

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Question 7

A sum of Rs 2400 is invested in two schemes A and B. Scheme A offers a simple interest of 9% per annum, and Scheme B offers a compound interest of 6% percent per annum. If the amount of interest obtained at the end of two years is Rs 400. Find the difference between the amounts invested in scheme A and B. (Approximately)

- A Rs 850
- B Rs 1400
- C Rs 900
- D Rs 1260

Answer: D

Explanation:

Let X and Y be the amounts invested in Scheme A and B respectively.

Interest obtained through scheme A $= 0.09 \cdot x \cdot 2 = 0.18x$

Interest obtained through scheme B $= (1.06^2 - 1) \cdot y = 0.1236y$

Given that $0.18x + 0.1236y = 400$ ---(1)

$X + y = 2400$ ---(2)

On solving equations (1) and (2) we get $x \sim 1830$, $Y = \sim 570$.

$\Rightarrow x - y = \text{Rs } 1260$

Question 8

Some amount was lent at 10% p.a Simple Interest. After 1 year, Rs 4400 is repaid and the rest of the amount is repaid at 20% p.a. If the 2nd year's interest is $11/7$ of the first year's interest, find the amount of money that was lent out initially ?

- A Rs.12000
- B Rs.13000
- C Rs.14000
- D Rs.15000

Answer: C

Explanation:

Let the amount be x .

After 1 year the amount becomes $1.1x$ out of which 4400 is repaid.

Interest for second year = 20% of $(1.1x - 4400)$

$$(1.1x - 4400)/5 = 11/7 (1.1x - x)$$

$$7.7x - 30800 = 55(0.1x)$$

$$2.2x = 30800$$

$$x = 14000$$

Rs 14000 was lent initially

Question 9

An amount was lent at a certain rate of interest compounded annually. Had the amount been lent at simple interest, the amount of interest would have been Rs 5400 less for initial two years and 17820 for initial three years, then the amount lent is equal to

A 72000

B 40000

C 80000

D 60000

Answer: D

Explanation:

Assuming the amount = P the rate of interest = $R\%$ and $R/100 = a$

For two years difference between compound and simple interest = $P(1+a)^2 - P - 2Pa = Pa^2 = 5400 \dots (1)$

Now for three years, the difference = $P(1+a)^3 - P - 3Pa = Pa^3 + 3Pa^2 = 17820 \dots (2)$

Putting the value of Pa^2 in (2), we get $5400a + 3 \times 5400 = 17820 \Rightarrow a = 3/10$

Now, on putting $a = 3/10$ in (1), we get $P \times 9/100 = 5400 \Rightarrow P = 60000$

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Question 10

An investor is faced with a dilemma about where to invest his savings of 10 lakhs. Scheme A gives 10% interest compounded annually for 2 years and simple interest of 20% for the next 3 years. If the amount has increased less than 60%, additional 10% is also added to it. Scheme B gives a simple interest of 10% for 2 years and compound interest of 20% for 3 years compounded annually. If the amount has increased less than 50%, additional 15% is added to it. If the investor goes with the right choice, how much does he earn over his initial investment ?

Answer: 1073600

Explanation:

To make the calculation easier, let us take the amount the investor wants to invest as x .

Scheme A :

Amount of the investment after 2 years, $a_2 = x \times (1.1)^2 = 1.21x$

Amount of investment after 5 years, $a_5 = 1.21x \times (1 + (0.2 \times 3)) = 1.936x$

Since the increase is more than 60%, the additional 10% won't be added to it.

Scheme B :

Amount of investment after 2 years, $b_2 = x \times (1 + (0.1 \times 2)) = 1.2x$

Amount of investment after 5 years, $b_5 = 1.2x \times (1.2)^3 = 2.0736x$

Since the increase is more than 50%, the additional 15% won't be added to it.

After looking at the interest earned, we can say that the investor should choose scheme B.

Amount earned by the investor = $10^6 \times (2.0736 - 1) = 1073600$

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