MBA Fastrack 2025 (CAT + OMETs)
QUANTITATIVE APTITUDE

Interest

Q1 Ujjwala deposited 5000 for 6 years, 4500 for 8 years, and 6500 for 4 years with the same rate of simple interest. She received a total simple interest of 4600. What is the rate of interest per annum?
(A) 8%　　　　　　　(B) 6%
(C) 5%　　　　　　　(D) 7%

Q2 Mr. Dhoni lent Rs.2400 each to Mr. Ajay and Mr. Vijay. The difference between the simple interests received from Mr. Ajay and Mr. Vijay after 4 years is Rs.28.8. The difference between their rates of interest is:
(A) 0.8%　　　　　　(B) 0.6%
(C) 0.3%　　　　　　(D) 0.1%

Q3 The amounts invested by Rachel, Sakshi, and Chandu were 10:5:2 correspondingly. Find the ratio of their amounts after a year if the schemes gave simple interest at the rates of 10%, 5%, and 15% per annum, respectively.
(A) 13:15:25　　　　(B) 16:6:5
(C) 220 : 105 : 46　　(D) 121:23:11

Q4 The compound interest on a certain sum of money invested at $14\frac{2}{7}\%$ per annum for 2 years is Rs. 960. The simple interest on the same sum, at the same rate and for the same time period is:
(A) Rs. 900　　　　　(B) Rs. 880
(C) Rs. 896　　　　　(D) Rs. 920

Q5 Ms. Larry provided a part of ₹90000 to Ms. Adani, one of her colleagues as a loan at 7% p.a SI for 5 years. She invested the remaining amount at 14% p.a SI. Total income from interest after 5 years was ₹52500. How much loan (in ₹) was provided to Ms. Adani?

(A) 30000　　　　　　(B) 35150
(C) 35500　　　　　　(D) 35550

Q6 If a certain sum of money will become 15 times of itself in 42 years at a certain rate of simple interest, then the same sum of money at the same rate of simple interest will become 17 times of itself in how many years?
(A) 48 years　　　　　(B) 54 years
(C) 50 years　　　　　(D) 52 years

Q7 Vicky invested a total sum of Rs. 60300 in three different schemes of simple interest at 8%, 15% and 21% per annum. At the end of one year, he got the same interest in all three schemes, then what is the sum of money he invested at a rate of interest of 15%?
(A) Rs. 14500　　　　(B) Rs. 13800
(C) Rs. 16400　　　　(D) Rs. 16800

Q8 Three friends Sudama, Peyush and Aryan won a lottery of Rs 15,400 and they wish to split the amount among themselves in such a way that, after 1, 2, and 3 years, respectively, the simple interest on each share at 5% per annum remains the same. Differences in Sudama and Aryan's share (in Rs.) will be:

Q9 In 2020, Eli places Rs. 20,000 in a 5-year deposit (Deposit A) that earns simple interest of 15% per annum. In 2023, she wants to place a 2-year deposit (Deposit B) that will provide the same amount at the end of 2025 as Deposit A. If Deposit B earns simple interest at 30% per annum, what is the principal (in Rs.) required for Deposit B?

Q10 In a housing loan, the interest is compounded quarterly, and the annual interest rate is 8%. If the total interest paid over the course of a 15-year loan is $48,000, what is the approximate principal amount of the loan? $[(1.02)^{60} \approx 3.281]$
(A) $12013   (B) $15023
(C) $18033   (D) $21043

Q11 Xavier makes a three-year investment of Rs. 5000 in a XYZ scheme at a compound interest rate of 5% p.a. At the completion of each year, a 10% tax on interest generated is deducted. Xavier received how much money (in Rs.) at the completion of the third year? (Round your answer to the nearest integer)

Q12 Amit earned Rs 10,000 at 16% simple annual interest in two years whereas in three years, Rahul earned Rs 12,000 at 10% simple annual interest. After how many years from the start will both their investments accumulate to the same total amount, if both the investments were made at the same time?
(A) 8 years
(B) 8 years 9 months
(C) 9 years 3 months
(D) 9 years 9 months

Q13 What is the time period required for an amount of Rs. 15,625,000 to earn an interest of Rs. 1,951,000 at a rate of 8% per annum, compounded semi-annually?
(A) 1 year   (B) 1.5 years
(C) 2 years   (D) 2.75 years

Q14 Riddhi obtained a loan of Rs. 72000 from a bank to buy an iPhone. What payment (in Rs.) will he be required to make after two years and four months if the interest rate is 10% per year compounded annually?
(A) 90,024   (B) 75,752
(C) 85,040   (D) 86,350

Q15 An entrepreneur takes a loan of Rs 384000 from a bank, that is to be returned in three years at a rate of 15.25% p.a. compound interest. He returns Rs 73360 and Rs 62303 after first and second year respectively. How much money (in Rs.) will he have to return after the third year to settle the loan?
(A) 401585   (B) 418588
(C) 425858   (D) 438505

Q16 Present age of P is 15 years, and he invested Rs.4500 at 20% annual compound interest while Q invested Rs.5824 at 25% annual compound interest. When they both turn 18 years, the interest amount received by both of them is the same, then how old is Q at present?
(A) 14 years   (B) 16 years
(C) 17 years   (D) 12 years

Q17 A woman invested Rs. 8800 in scheme A at 10% per annum simple interest for 3 years and the same amount at the same rate for the same time in scheme B compounding annually. What will be the difference between the interest earned from scheme A and B after 3 years?
(A) Rs. 272.8   (B) Rs. 264.2
(C) Rs. 288.4   (D) Rs. 248.6

Q18 A sum of Rs. 23000 at a certain rate of interest in simple interest for eight years amounts to Rs. 43240. If the same sum of money at the same rate of interest compounded annually for two years, then what is the interest earned after 2 years?
(A) Rs. 5348.6   (B) Rs. 5338.3
(C) Rs. 5563.2   (D) Rs. 5526.8

Q19 Mahi makes a deposit in a bank at the rate of 20% per annum for $1\frac{1}{2}$ years. If the maturity value of the money deposited in the bank is Rs.22627 when compounded half yearly, then find the amount deposited by Mahi.
(A) Rs.13600   (B) Rs. 15600
(C) Rs.13000   (D) Rs.17000

Q20 A certain amount is invested at 30% annual CI for 2.5 years and interest accrued at the end of 2.5 years is Rs.11322, then what is that certain invested amount?

(A) Rs. 16000   (B) Rs. 12000

(C) Rs. 20000   (D) Rs. 24000

Q21 A sum of money becomes 3 times in 40 years when invested at a certain annual rate of simple interest. The compound interest earned on the same sum at the same annual rate of interest in 2 years is Rs. '*abc*', where *a*, *b* and *c* represent three distinct non-zero digits. If the sum invested is an integer not exceeding Rs. 5,000, then its value (in rupees), such that (*a* + *b* + *c*) is maximum, is

Q22 A company deposits some funds in a savings account with a fixed annual interest rate, compounded yearly. The interest earned during the second and third years is ₹2200 and ₹2420, respectively. The interest earned in the fifth year (in ₹), is:

Q23 A man invested 20000 rupees in a scheme that generates 20% interest compounded annually. However, he withdraws a fixed amount of money at the end of every year for buying a bike. At the end of the third year, he finally received a total of 22,680 rupees and thus closed his account. Find the amount (in rupees) that he withdrew yearly.

(A) 4000   (B) 3500

(C) 5000   (D) 4500

Q24 Compound interest on Rs. 5Y at 40% per annum for one year when compounded half-yearly is Rs. 196 more than the compound interest on Rs. 8(100 + Y) at 10% per annum for two years when compounded annually. Find the value of 'Y'.

(A) 500   (B) 600

(C) 700   (D) 800

Q25 An investor deposits $20,000 in a bank offering a 10% annual interest rate compounded annually for 3 years. After 3 years, the bank changes its interest rate to 12% per annum compounded semi-annually. What will be the approximate account balance at the end of 4 years?

(A) $26089.874

(B) $29910.232

(C) $30,623.413

(D) $32,062.392

Q26 A certain amount of money earns compound interest at an annual rate of 10%. The total interest earned during the second and third years is Rs. 9240. What is the principal amount (initial investment) in rupees?

(A) Rs 40000   (B) Rs 36000

(C) Rs 33000   (D) Rs 27000

Q27 Sita invested Rs. a in deposit P and Rs. 342,000 in deposit Q, each for a 2-year period. The annual interest rates for deposits P and Q were 8% and 28% respectively, compounded annually. If the combined interest from both deposits was equivalent to 20% per annum compounded annually, what will be one fourth of a?

(A) Rs 92000   (B) Rs 57000

(C) Rs 84000   (D) Rs 62000

Q28 Ravi invests Rs. 42,000 for 4 years in a scheme that offers 8% interest per annum, compounded quarterly. Priya invests a certain sum amount in the same scheme for $3\frac{1}{2}$ years, and then reinvests the total amount obtained at the end of $3\frac{1}{2}$ years for six months at 10% simple interest per annum. If both receive the same amount at the end of 4 years, what was Priya's initial investment in rupees?

(A) 42820   (B) 41616

(C) 38768   (D) 43267

Q29 Priya invested a part of Rs. 1.5 lakhs in simple interest at a rate of 8% per annum for 3 years and the remaining amount in compound interest at a rate of 10% per annum compounded annually for 3 years. If she receives Rs. 43280 as the total interest after 3 years, how much (in Rs.) did she invest in the compound interest?

Q30 A business owner placed a certain amount of inventory in a storage facility that appreciated in value by 20% annually, compounded semi-annually. After $1\frac{1}{2}$ years, the total value of the inventory became Rs 33,275. The initial value, in rupees, of the inventory placed in storage is:

Answer Key

Q1	C		Q16	B
Q2	C		Q17	A
Q3	C		Q18	B
Q4	C		Q19	D
Q5	A		Q20	B
Q6	A		Q21	3600
Q7	D		Q22	2928.2
Q8	5600		Q23	D
Q9	21875		Q24	C
Q10	D		Q25	B
Q11	5706		Q26	A
Q12	B		Q27	D
Q13	B		Q28	B
Q14	A		Q29	80000
Q15	B		Q30	25000

Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Let the rate of interest be r% per annum.

Therefore, $4600 = (5000 \times 6 \times \frac{r}{100}) + (4500 \times 8 \times \frac{r}{100}) + (6500 \times 4 \times \frac{r}{100})$

=> 4600 = 300r + 360r + 260r

=> 4600 = 920r

=> r = 5%

Hence, option (c) is correct.

Video Solution:

Q2 Text Solution:

Let rate of interest for Mr. Ajay = x% and for Mr. Vijay = y%

Therefore,

$(2400 \times x \times \frac{4}{100}) - (2400 \times y \times \frac{4}{100}) = 28.8$

[Assuming x > y]

- $96(x - y) = \frac{288}{10}$

- (x - y) = 0.3%

Difference between their rates of interest = 0.3%

Video Solution:

Q3 Text Solution:

According to the question,

$\left[10 \times \left(1 + \frac{10}{100}\right)\right] : \left[5 \times \left(1 + \frac{5}{100}\right)\right]$

$: \left[2 \times \left(1 + \frac{15}{100}\right)\right]$

$= \left(10 \times \frac{11}{10}\right) : \left(5 \times \frac{21}{20}\right) : \left(2 \times \frac{23}{20}\right)$

= 220 : 105 : 46

Hence, the correct answer is option (C).

Video Solution:

Q4 Text Solution:

Topic - Compound Interest

$$CI = P\left(1 + \frac{R}{100}\right)^{T} - P$$

$$960 = P\left[\left(1 + \frac{100}{7 \times 100}\right)^{2} - 1\right]$$

$$960 = P\left[\left(\frac{8}{7}\right)^{2} - 1\right]$$

$$960 = \frac{15P}{49}$$

P = Rs. 3136

$$SI = 3136 \times \frac{100 \times 2}{7 \times 100}$$

= Rs. 896

Hence, the correct answer is option (C).

Video Solution:

Q5 Text Solution:

Let x be the sum that she lent to his colleague.

Therefore, $\frac{(x \times 7 \times 5)}{100} + \frac{[(90000-x) \times 14 \times 5]}{100} = 52500$

$$35x + 70(90000 - x) = 5250000$$

$$-35x = -1050000$$

x = ₹30000

Video Solution:

Q6 Text Solution:

Let principal = Rs. P, and rate = R%, time = 42 years

$15P - P = \frac{(P \times R \times 42)}{100}$

$\Rightarrow 14 = \frac{42R}{100}$

$\Rightarrow R = 14 \times \frac{100}{42}$

$\Rightarrow R = \frac{100}{3}\%$

Now, $17P - P = \frac{(P \times \frac{100}{3} \times T)}{100}$

$\Rightarrow 16 \times 3 = T$

$\Rightarrow T = 48$ years

Video Solution:

Q7 Text Solution:

Let Rs. X, Rs. Y and Rs. Z is invested in three different schemes of simple interest at 8%, 15% and 21% per annum respectively.

According to the question,

X + Y + Z = 60300 ---(1)

And, $\frac{(X \times 8 \times 1)}{100} = \frac{(Y \times 15 \times 1)}{100} = \frac{(Z \times 21 \times 1)}{100}$

$\Rightarrow 8X = 15Y = 21Z$

Let 8X = 15Y = 21Z = k

So, $X = \frac{k}{8}$, $Y = \frac{k}{15}$ and $Z = \frac{k}{21}$

Putting values of X, Y and Z in equation (1), we get

$\frac{k}{8} + \frac{k}{15} + \frac{k}{21} = 60300$

$\Rightarrow \frac{(105k + 56k + 40k)}{840} = 60300$

$\Rightarrow 201k = 60300 \times 840$

$\Rightarrow k = 252000$

So, investment at 15% rate of interest = $\frac{k}{15}$ = $\frac{252000}{15}$ = Rs. 16800

Video Solution:

Q8 Text Solution:

Let the share of Sudama, Peyush and Aryan be x, y and z.

$\frac{x \times 5 \times 1}{100} = \frac{y \times 5 \times 2}{100} = \frac{z \times 5 \times 3}{100}$

x = 2y = 3z = k (say)

$x : y : z = k : \frac{k}{2} : \frac{k}{3} = 6 : 3 : 2$

The difference in Sudama and Aryan's share

= Rs. $\frac{4}{11} \times 15400$

= Rs. 4 × 1400

= Rs. 5600

Video Solution:

Q9 Text Solution:

Topic - Simple Interest

Let P be the principal placed as a 2-year deposit (Deposit B) for simple interest at the rate of 30%. Given that Deposit A and Deposit B provide the same amount at the end of 2025.

$$20000 + \frac{20000 \times 5 \times 15}{100} = P + \frac{P \times 2 \times 30}{100}$$

$$35000 = 1.6P = P \times \frac{8}{5}$$

$$P = 21875$$

Video Solution:

Q10 Text Solution:

We know that the total interest paid over the 15-year loan is

$48,$

$000. Let's\ denote\ the\ principal\ amount\ as\ P. Then, the\ Amount\ (final\ balance)\ will\ be\ P +$

$48,000.

The annual interest rate is 8% (0.08 as a decimal), and the loan duration is 15 years.

Using the compound interest formula, we get:

Amount = P × (1 + ($\frac{0.08}{4}$))$^{(4 × 15)}$

Since the total interest paid is $48,000, we can rewrite the equation as:

P + $48,000 = P × (1 + ($\frac{0.08}{4}$))$^{(4 × 15)}$

P + $48,000 = P × (1 + 0.02)$^{(60)}$

Subtract P from both sides:

$48,000 = P × ((1.02)^{60} - 1)

P =

$\frac{\$48,000}{(1.02)^{60} - 1}$

$P = \frac{\$48,000}{2.281} \left(Given\ (1.02)^{60} = 3.281\right)$

P ≈ $21043

Video Solution:

Q11 Text Solution:

Given that 5% is the rate of interest and 10% tax will be charged only on the interest part.

Therefore, effective rate of interest will be 5 x 0.9 = 4.5%, therefore the amount after 3 years will be

$5000\ (1.045)^{3}$

$= 5705.830625\ or\ 5706\ when\ rounded\ off\ to\ nearest\ integer$

Video Solution:

Q12 Text Solution:

Let the principal amount for Amit be A and that for Rahul be R

So,

$\frac{A \times 16 \times 2}{100} = 10000$

$\Rightarrow A = Rs\ 31250$

and

$\frac{R \times 10 \times 3}{100} = 12000$

$\Rightarrow R = Rs\ 40000$

Let n be the number of years in which both of their investments will accumulate to the same total amount, so

$A + \frac{A \times 16 \times n}{100} = R + \frac{R \times 10 \times n}{100}$

$\Rightarrow A\left(1 + \frac{16n}{100}\right) = R\left(1 + \frac{10n}{100}\right)$

$\Rightarrow 31250\left(\frac{100 + 16n}{100}\right) = 40000\left(\frac{100 + 10n}{100}\right)$

$\Rightarrow 25\left(100 + 16n\right) = 32\left(100 + 10n\right)$

$\Rightarrow 2500 + 400n = 3200 + 320n$

$\Rightarrow n = \frac{700}{80} = 8.75 years = 8\ years\ 9\ months$

Alternatively difference between their amounts = Rs 8750

As Amit is covering Rs. 1000 per year, time taken $= \frac{8750}{1000} = 8.75\ years$

= 8year + 0.75 year

= 8year + 12months * 3/4 year

= 8year + 9 months (Option B is correct)

Video Solution:

Q13 Text Solution:

A = P + CI

A = 15625000 + 1951000

A = 17576000

Let time period = $\frac{n}{2}$ years

Rate of interest = R = 8% p.a. = $\frac{8}{2}$ = 4% semi-annually

Principal = P = 15625000 and Amount = A = 17576000

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

$$\Rightarrow 17576000 = 15625000(1 + 0.04)^n$$

$$\Rightarrow 17576000 = 15625000(1 + 0.04)^n$$

$$\Rightarrow \frac{17576000}{15625000} = \left(\frac{104}{100}\right)^n$$

$$\Rightarrow \left(\frac{26}{25}\right)^3 = \left(\frac{26}{25}\right)^n$$

- n = 3

Time period = $\frac{3}{2}$ = 1.5 years.

Hence, the correct answer is option (B).

Video Solution:

Q14 Text Solution:

Principal amount is Rs. 72,000.

Rate of interest is 10% p.a

Time = $(2 + \frac{1}{3})$ years.

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

$$\Rightarrow A = 72000\left(1 + \frac{10}{100}\right)^2 \left(1 + \frac{10/3}{100}\right)$$

$$\Rightarrow A = 72000\left(\frac{11}{10}\right)^2 \times \left(1 + \frac{10}{3 \times 100}\right)$$

$$\Rightarrow A = 72000\left(\frac{121}{100} \times \frac{31}{30}\right)$$

$$\Rightarrow A = 90,024$$

Hence, option (A) is correct.

Video Solution:

Q15 Text Solution:

Money took = Rs 384000

Amount after first year

= 384000 × $(1 + \frac{15.25}{100})$

= 442560

Amount paid after first year = 73360, amount remaining = 442560 – 73360 = 369200

Amount to be paid after second year

= 369200 × $(1 + \frac{15.25}{100})$

= 425503

Amount paid after second year = 62303, amount remaining = 425503 – 62303 = 363200

Amount to paid after third year

= 363200 × $(1 + \frac{15.25}{100})$

= Rs 418588

Hence, option (B) is correct.

Video Solution:

Q16 Text Solution:

Let at present Q is 'x' years younger to become 18 years old.

Interest amount received by P when he turns

18 years = 4500 × [(1.2)^3 - 1] = Rs.3276

Interest amount received by Q when he turns

18 years = 5824 × [(1.25)^x -1] = 3276

$(1.25)^x -1 = \frac{9}{16}$

$1.25^x = (\frac{9}{16}) + 1$

$1.25^x = 1.5625 = 1.25^2$

x = 2

Present age of Q = 18-2 = 16 years

Video Solution:

Q17 Text Solution:

Topic - Simple and Compound Interest

Simple interest earned from scheme A = 8800

$\times 10 \times \frac{3}{100}$ = 88 × 30 = Rs.2640

Amount = Principal + Interest, so Interest = Amount - Principal

Compound interest earned from scheme B =

$8800 \times [(1 + \frac{10}{100})^3 - 1]$

$= 8800 \times \frac{331}{1000}$ = Rs. 2912.8

Required difference = Rs. 2912.8 - 2640 = Rs. 272.8

Video Solution:

Q18 Text Solution:

Let R% be the rate of interest.

$43240 - 23000 = \frac{(23000 \times R \times 8)}{100}$

$=> R = \frac{20240}{1840}$

=> R = 11%

So, CI = $23000 \times [(1 + \frac{11}{100})^2 - 1]$

=> CI = Rs. 5338.3

Video Solution:

Q19 Text Solution:

Let the amount deposited by Mahi = Rs. P

$1\frac{1}{2}$ years = $\frac{3}{2}$ years

Then, maturity value of money when compounded half yearly

= sum × $(1 + \frac{rate}{200})^{2 \times time}$

Now, 22627 = P × $(1 + \frac{20}{200})^{2 \times 3/2}$

P = 22627× $(\frac{10}{11})$ × $(\frac{10}{11})$ × $(\frac{10}{11})$

P = 17000

Video Solution:

Q20 Text Solution:

Let the certain amount be Rs. 100x

Interest for the first year = 30% of 100x = 30x

Interest for the second year = (30% of 100x) + (30% of 30x) = 30x + 9x

Interest for the next half year = (15% of 100x) + [15% of (30x + 30x)] + [15% of 9x]

= 15x + 9x + 1.35x

Interest amount at the end of 2.5 years

= 30x + (30x + 9x) + (15x + 9x + 1.35x) = 11322

=> 94.35x = 11322

x = 120

Hence, invested amount = 100x = Rs. 12000

Video Solution:

Q21 **Text Solution:**

Let the principal be Re. 1. The amount after 40 years = Rs. 3.

So, interest earned in 40 years = Rs. 2, which is 200% of principal in 40 years.

Rate per cent per annum = $\frac{200\%}{40} = 5\%$ p.a.

Now, let the principal be Rs. P.

Given that, P $\left(\left(1 + \frac{5}{100}\right)^2 - 1\right) = abc$

$\Rightarrow$ P $\times \frac{41}{400} = abc$

$\Rightarrow$ P = $\frac{abc}{41} \times 400$

Now, for P to be an integer, abc should be a three-digit multiple of 41.

Possible values: 123, 164, 246, 287, 328, **369**, 451, 492

(205 and 410 are not considered as digits are non-zero; multiples beyond 492 will make P > 5000)

Sum of digits is maximum for 369. So, the value of P = $\frac{369}{41} \times 400 =$ **Rs. 3,600** (Correct Answer)

Video Solution:

Q22 **Text Solution:**

Let the company invested ₹P at x% interest rate.

Then, the interest earned in the first year =

$P\left(1 + \frac{x}{100}\right) - P = \frac{Px}{100}$

The interest earned in the second year

$= \frac{Px}{100}\left(1 + \frac{x}{100}\right) - \frac{Px}{100} = P\left(\frac{x}{100}\right)^2$

Similarly, the interest earned in the third year

$= P\left(\frac{x}{100}\right)^3$

Therefore, we can notice that the interest increases in a GP.

So, the common ratio of the GP = $\frac{2420}{2200}$

Therefore, in the fifth year, the interest earned by the company

$= 2420 \times \left(\frac{2420}{2200}\right)^2$

$= 2420 \times (1.1)^2$

$= ₹2928.2$

Video Solution:

Q23 **Text Solution:**

Let the amount being withdrawn be x.

At the end of the first year:

Money after intrest=20,000(1.2)=24,000

Money after withdrawl=24,000-x.

At the end of the second year:

Money after interest =(24,000-x)(1.2)=28,800-1.2x

Money after withdrawl=28,800-1.2x-x=28,800-2.2x

At the end of the third year:

Money after interest=(28,800-2.2x)(1.2)=34,560-2.64x

The money received at the end of the third year=22,680

34,560-2.64x=22,680

11,880=2.64x

x=4,500

Therefore he withdrew 4,500 every year.

Video Solution:

Q24 Text Solution:

Compound interest when compounded annually

$$= \text{sum} \times \left(\left(1+ \frac{\frac{\text{rate}}{2}}{100}\right)^{2 \times \text{time}} - 1\right)$$

Then, compound interest on Rs. 8(100+ Y) at 10% per annum for two years when compounded annually = $8(100+ Y) \times \left(\left(1+ \frac{10}{100}\right)^2 -1\right)$

$= 8(100+ Y) \times \frac{21}{100}$

$= 168 + 1.68Y$

And compound interest when compounded half yearly

$$= \text{sum} \times \left(\left(1+ \frac{\text{rate}}{200}\right)^{2 \times \text{time}} - 1\right)$$

Then, compound interest on Rs. 5Y at 40% per annum for one year when compounded half-yearly

$= 5Y \times \left(\left(1 + \frac{40}{200}\right)^{2\times1} - 1\right)$

$= 5Y \times \frac{11}{25}$

$= 2.2Y$

Now, $168 + 1.68Y = 2.2Y - 196$

$0.52Y = 364$

$Y = 700$

Video Solution:

Q25 Text Solution:

Let's solve this problem step by step.

Calculate the account balance after the first 3 years at 4% annual interest compounded annually:

Principal (P) = $20,000

Annual interest rate (R) = 10% = 0.10

Time (T) = 3 years

Future Value (FV) = P × (1 + R)^T

FV = $20,000 × (1 + 0.10)^3

FV ≈ $20,000 × 1.331

FV ≈ $26620

The account balance after 3 years is approximately $26620.

Calculate the account balance after the next 3 years at 12% annual interest compounded semi-annually:

Principal (P) = $26620

Annual interest rate (R) = 12% = 0.12

Semi-annual interest rate ($\frac{R}{2}$) = $\frac{0.12}{2}$ = 0.06

Time (T) = 1 years

Since the interest is compounded semi-annually, we have to double the time and use the semi-annual interest rate.

Number of periods (N) = 1 years × 2 = 2 periods

Future Value (FV) = P × $\left(1 + \frac{R}{2}\right)^{2T}$

FV = $26620 × (1 + 0.06)^2

FV ≈ $26620 × 1.1236

FV ≈ $29910.232

The account balance at the end of 4 years is approximately $29910.232

Video Solution:

Q26 Text Solution:

Considering the principal amount to be P,

First year interest = $\frac{10 \times P}{100} = \frac{P}{10}$ (Using this ratio in further cases)

Second year interest = $\frac{P}{10} + \frac{P}{10^2} = \frac{11P}{10^2}$

Third year interest = $\frac{P}{10} + \frac{2P}{10^2} + \frac{P}{10^3} = \frac{121P}{10^3}$

Interest earned in second and third year combined = 9240

$\Rightarrow \frac{11P}{10^2} + \frac{121P}{10^3} = 9240$

$\Rightarrow 231P = 1000 \times 9240$

$\Rightarrow P = Rs\ 40000$

Video Solution:

Q27 Text Solution:

Amount obtained on first deposit =

$a\left(1 + \frac{8}{100}\right)^2$

Amount obtained on second deposit =

$342000\left(1 + \frac{28}{100}\right)^2$

Amount obtained on both deposit at rate of 20% per annum compounded annually =

$\left(a + 342000\right)\left(1 + \frac{20}{100}\right)^2$

So

$a\left(\frac{108}{100}\right)^2 + 342000\left(\frac{128}{100}\right)^2$
$= \left(a + 342000\right)\left(\frac{120}{100}\right)^2$

$\Rightarrow a(108)^2 + 342000(128)^2$
$= \left(a + 342000\right)(120)^2$

$\Rightarrow a\left(\frac{108}{120}\right)^2 + 342000\left(\frac{128}{120}\right)^2 = a$
$+ 342000$

$\Rightarrow \frac{81}{100}a + \frac{342000 \times 256}{225} = a + 342000$

$\Rightarrow a - 0.81a = 342000\left(\frac{256}{225} - 1\right)$

$\Rightarrow a = \frac{342000 \times 31}{0.19 \times 225} = Rs\ 248000$

Therefore one fourth of a = Rs 62000

Alternatively

Interest percentage obtained on a (in

multiplicative index)=$(1.08)^2 - 1 = 0.1664$

Interest percentage obtained on 342000(in

multiplicative index)=$(1.28)^2 - 1 = 0.6384$

Interest percentage obtained on total amount(in multiplicative index)=

$(1.2)^2 - 1 = 0.44$

Using alligation and mixtures formula

$\frac{a}{342000} = \frac{0.6384 - 0.44}{0.44 - 0.1664}$

$\Rightarrow a = \frac{342000 \times 0.1984}{0.2736} = Rs\ 248000$

So one fourth of a = Rs 62000

Video Solution:

Q28 Text Solution:

Amount obtained by Ravi after 4 years =

$42000\left(1 + \frac{\frac{8}{4}}{100}\right)^{4 \times 4} = 42000(1.02)^{16}$

Let the amount invested by Priya is x

So Amount obtained by Priya after 3.5 years =

$x\left(1 + \frac{\frac{8}{4}}{100}\right)^{3.5 \times 4} = x(1.02)^{14}$

Amount obtained by Priya after 4 years =

$x(1.02)^{14} + \frac{x(1.02)^{14} \times 10 \times \frac{6}{12}}{100}$

$= x(1.02)^{14}\left(1 + \frac{5}{100}\right)$

$= x(1.02)^{14}\left(1.05\right)$

So

$42000(1.02)^{16} = x(1.02)^{14}\left(1.05\right)$

$\Rightarrow x = \frac{42000 \times (1.02)^{16}}{(1.02)^{14} \times 1.05} = \frac{42000 \times 1.0404}{1.05} = Rs$

41616

Video Solution:

Q29 Text Solution:

Let the amount invested at 10% CI be Rs x and the amount invested at 8% SI be Rs. (150000-x), so

$$x\left[\left(1 + \frac{10}{100}\right)^3 - 1\right] + \frac{(150000-x)\times 8 \times 3}{100}$$
$$= 43280$$
$$\Rightarrow 0.331x + \frac{3600000 - 24x}{100} = 43280$$
$$\Rightarrow 33.1x - 24x = 4328000 - 3600000$$
$$\Rightarrow 9.1x = 728000$$
$$\Rightarrow x = Rs\ 80000$$

Amount invested in CI = Rs 80000

Video Solution:

Q30 Text Solution:

Let the business owner invested ₹ x in his storage facility.

Since he invested his amount for one and half years at a compound interest of 20% sem-annually, so at the end of 1.5 years, he will get

$$= x \times \left(1 + \frac{\frac{20}{2}}{100}\right)^3$$
$$= x \times \left(1 + \frac{10}{100}\right)^3$$
$$= x \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10}$$

According to the question, at the end of 1.5 years, his inventory becomes ₹33,275, so we have

$$x \times \frac{11}{10} \times \frac{11}{10} \times \frac{11}{10} = 33275$$
$$x = 33275 \times \frac{1000}{11 \times 11 \times 11} = ₹25,000$$

So, he invested ₹25,000 into his inventory.

Video Solution:

Android App | **iOS App** | **PW Website**