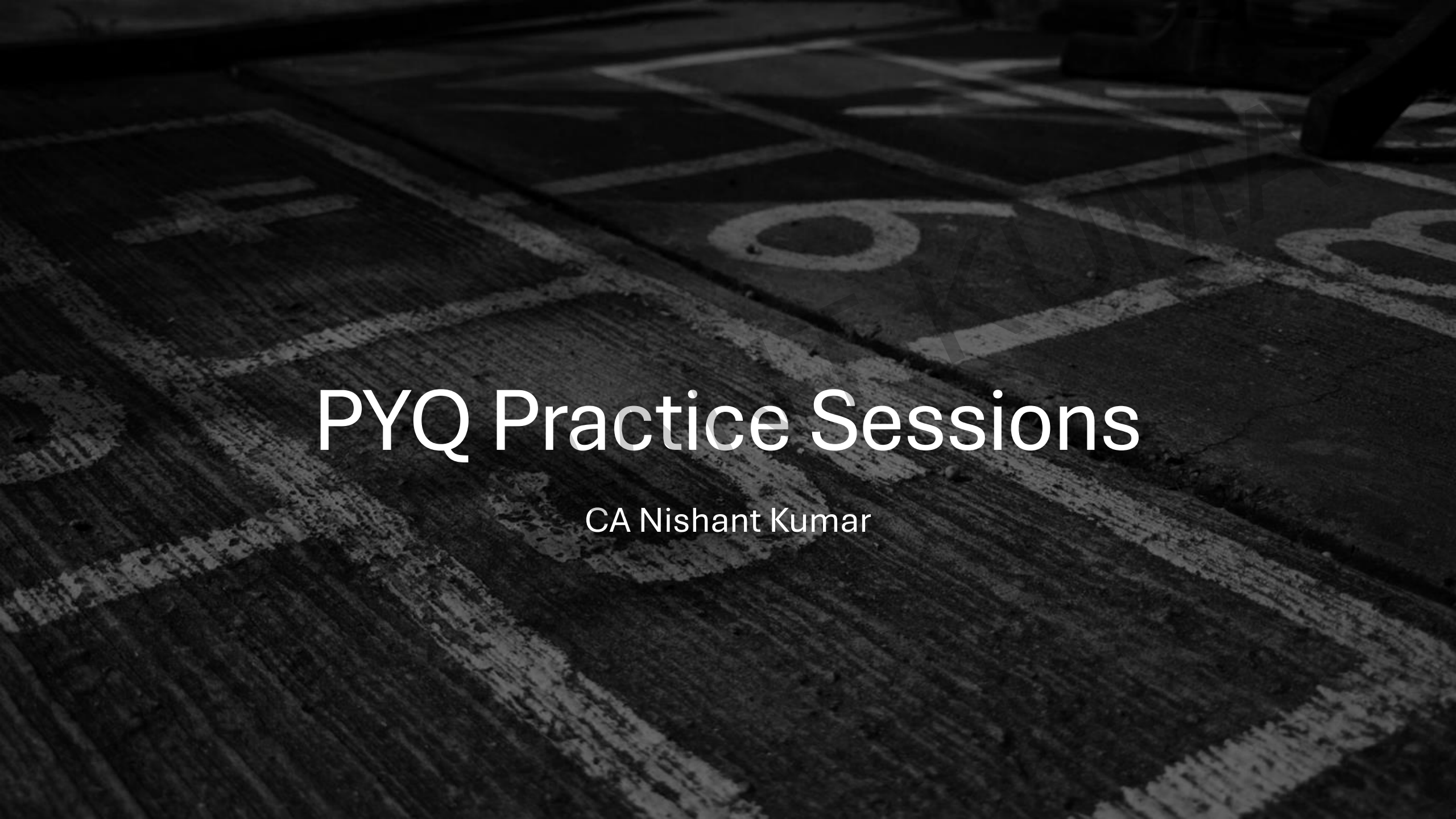


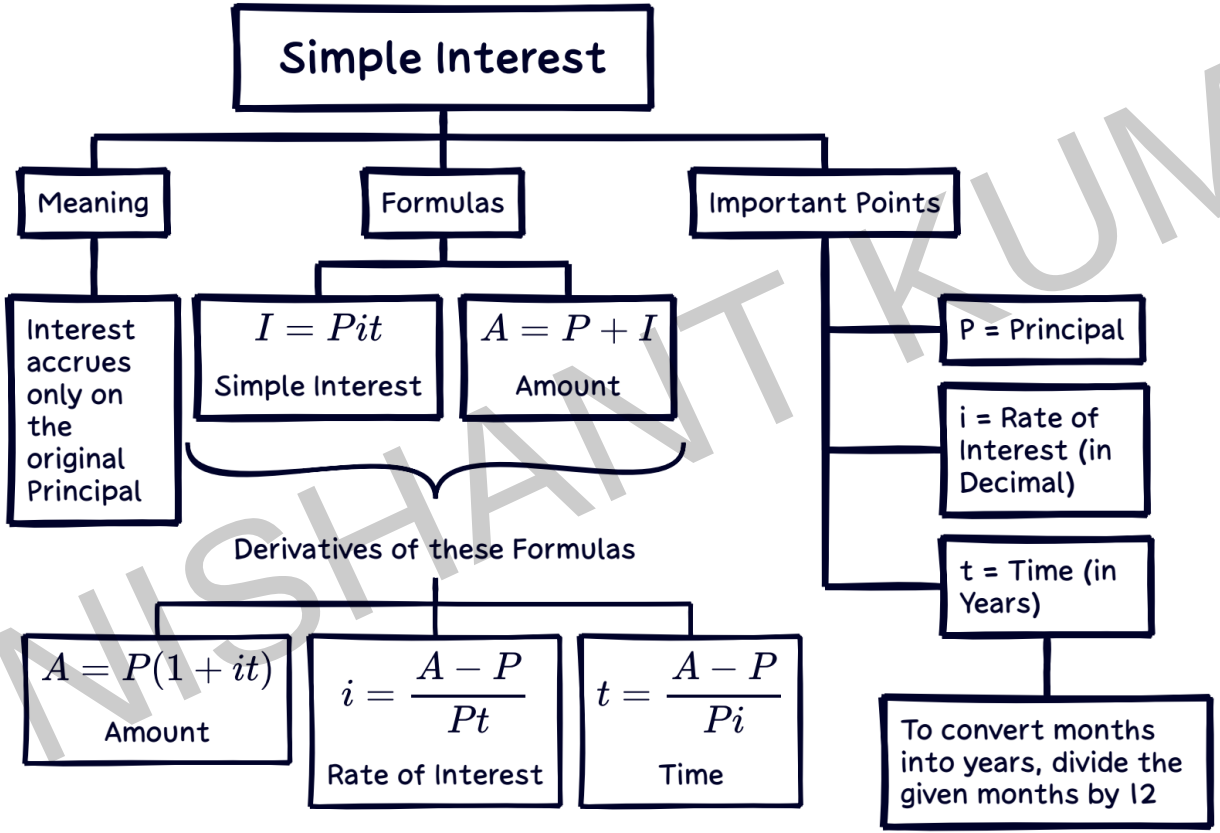
PYQ Practice Sessions

CA Nishant Kumar

Schedule

Date	Day	Topic
12-11-2024	Tuesday	Mathematics for Finance
14-11-2024	Thursday	Logical Reasoning
19-11-2024	Tuesday	Measures of Central Tendency and Dispersion
21-11-2024	Thursday	Ratio, Proportion, Indices, Logarithms
26-11-2024	Tuesday	Equations; Linear Inequalities
28-11-2024	Thursday	Sequence and Series
03-12-2024	Tuesday	Correlation and Regression
05-12-2024	Thursday	Index Numbers
10-12-2024	Tuesday	Permutations and Combinations
12-12-2024	Thursday	Sets, Relations, Functions
17-12-2024	Tuesday	Statistical Description of Data
19-12-2024	Thursday	Probability
24-12-2024	Tuesday	Theoretical Distributions

Chapter 4 – Mathematics for Finance – Past Year Questions



Question

The sum required to earn a monthly interest of ₹ 1,200 at 18% per annum simple interest is:

(a) ₹ 60,000 (b) ₹ 50,000

(c) ₹ 80,000 (d) ₹ 66,000 (1 mark)

(September 2024)

Question

An amount ₹ 4,500 becomes ₹ 7,200 in two years at a simple interest rate of:

(a) 15% (b) 25%

(c) 30% (d) 40% (1 mark)

(June 2024)

Question

Mr. XYZ invested ₹ 60,000 in a nationalized bank in the form of fixed deposit at the rate of 7.5% per annum simple interest rate. He received ₹ 73,500 after the end of the term of fixed deposit. Calculate the period for which ₹ 60,000 was invested in fixed deposit.

(a) 3 Years (b) 3.5 Years

(c) 4 Years (d) 4.5 Years (1 mark)

(December 2023)

Question

Manoj invests ₹ 12,000 at 6% per annum simple interest to obtain a total amount of ₹ 14,880. What is the time for which the amount was invested?

(a) 3 years (b) 4 years

(c) 2 years (d) 5 years (1 mark)

(December 2023)

Question

Mr. Ram invested a total of one lakh in two banks for a fixed deposit. The first bank offers an interest rate of 9% per annum, while the second bank offers an interest rate of 11% per annum. If the total interest earned at the end of one year is 9.75% per annum, then what is the amount invested in each bank, respectively?

(a) ₹52,500, ₹47,500
(b) ₹62,500, ₹37,500
(c) ₹57,500, ₹42,500
(d) ₹67,500, ₹32,500

(June 2023)

Question

A farmer borrowed ₹ 3,600 at the rate of 15% simple interest per Annum. At the end of 4 years, he cleared this account by paying ₹ 4,000 and a cow. The cost of the cow is:

(a) ₹ 1,000 (b) ₹ 1,200

(c) ₹ 1,550 (d) ₹ 1,760 (1 mark)

(December 2022)

Question

In how much time a sum of amount doubles at simple interest at 12.5% rate?

(a) 7 year (b) 8 year

(c) 9 year (d) 10 year (1 mark)

(June 2022)

Compound Interest

Meaning

Interest is calculated not only on the original Principal, but also on the interest accrued on it.

Formulas

$$A = P\left(1 + \frac{i}{NOCPPY}\right)^{t \times NOCPPY}$$

Amount

$$CI = P\left[\left(1 + \frac{i}{NOCPPY}\right)^{t \times NOCPPY} - 1\right]$$

Compound Interest

Important Points

NOCPPY = No. of Conversion Periods Per Year

Rate of Interest	NOCPPY
Compounded Annually	NOCPPY = 1
Compounded Semi-Annually	NOCPPY = 2
Compounded Quarterly	NOCPPY = 4
Compounded Monthly	NOCPPY = 12

$$n = t \times NOCPPY$$

CA NISHANT KUMAR

Question

Mr. X makes a deposit of ₹ 12,000 in a bank where the amount doubles at compound interest in 5 years, then what will be the total amount he will have after twenty years?

(a) ₹ 1,20,000
(b) ₹ 96,000
(c) ₹ 1,24,000
(d) ₹ 1,92,000

(1 mark)

(September 2024)

Question

What is the present value of ₹1,000 to be received after two years compounded annually at 10% interest rate?

(a) ₹826 (b) ₹800 (c) ₹836 (d) ₹835

(September 2024)

Question

The compound interest on ₹40,000 at 12% per annum compounded quarterly for 6 months is:

(a) ₹2,463 (b) ₹2,643 (c) ₹2,364 (d) ₹2,436

(September 2024)

Question

Kanta wants to accumulate ₹4,91,300 in her savings account after three years. The rate of interest offered by bank is 6¼% per annum compounded annually. How much amount should she invest today to achieve her target amount?

(a) ₹4,37,500 (b) ₹4,09,600 (c) ₹46,900 (d) ₹49,600

(September 2024)

Question

You are considering two investments. Investment A yields 10% compounded quarterly. Investment B yields r% compounded semi-annually. Both investment have equal annual yields. Find r.

(a) 19.875%
(b) 10.0%
(c) 10.38%
(d) 10.125%

(1 mark)

(June 2024)

Question

At 8% compounded annually, how long will it take ₹ 750 to double?

(a) 6.5 years (b) 48 months

(c) 9.0 years (d) 12.0 years (1 mark)

(June 2024)

Question

What is the present value of an investment that pays ₹ 400 at the end of three years and ₹ 500 at the end of 6 years?

(a) ₹ 320 (b) ₹ 355

(c) ₹ 340 (d) ₹ 280 (1 mark)

(June 2024)

Question

You bought a painting 10 years ago as an investment. You originally paid ₹ 85,000 for it. If you sold it for ₹ 4,84,050. What was your annual return on investment?

(a) 47.0% (b) 4.7%

(c) 19.0% (d) 12.8% (1 mark)

(June 2024)

Question

What is the present value of ₹ 5,000 to be obtained after six years if the interest rate is 5% per annum? (Use the following if needed $= \frac{1}{1.05^4} = 0.74621, 0.71068, 0.67686.$ and 0.64462 for is = 6,7,8 and 9 respectively):

(a) ₹ 3,731 (b) ₹ 3,553

(c) ₹ 3,384 (d) ₹ 3,223 (1 mark)

(June 2024)

Question

A person invests in a fund that pays 4% per annum for the four years. The future value of current ₹ 4,000 would be ₹ _____. (Use, if needed, $(1.04)^4 = 1.1698$, $\frac{1}{(1.4)^4} = 0.8548$. $(1.04)^4 = 1.2160$ and $\frac{1}{(1.4)^1} = 0.8219$):

(a) ₹ 3,419 (b) ₹ 4,679

(c) ₹ 4,866 (d) ₹ 3,287 (1 mark)

(June 2024)

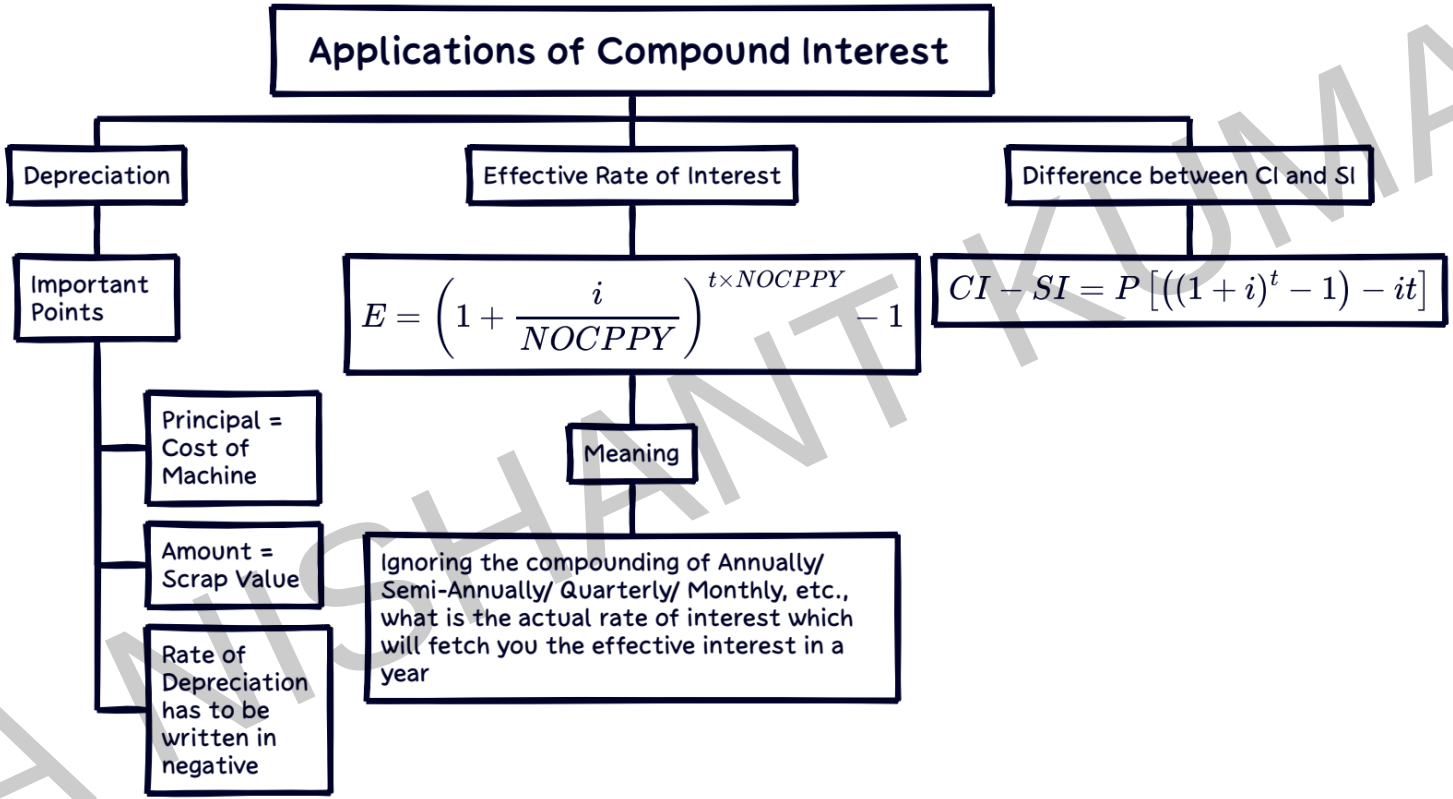
Question

Ram borrowed ₹ 5,000 at 12.5% per annum compound interest. The money was repaid after 3 years. The total interest paid by him approximately is _____. If $(1+0.125)^2 = 1.4238$:

(a) ₹ 2,119
(b) ₹ 2,200
(c) ₹ 2,000
(d) ₹ 2,500

(1 mark)

(June 2024)



Question

The value of a machine depreciates every year at the rate of 10% per annum, on its value at the beginning of that year. If the present value of the machine is ₹72,900, then machine's worth 3 years ago was:

(a) ₹80,000 (b) ₹94,710 (c) ₹1,00,000 (d) ₹75,087

(September 2024)

Question

A machine costing ₹ 1,00,000 has useful life of 10 years. If the rate of depreciation is 12%, what is scrap value of the machine at the end of life? Given $(0.88)^{10} = 0.27850$

(a) ₹ 25,850 (b) ₹ 26,850

(c) ₹ 27,850 (d) ₹ 28,850 (1 mark)

(December 2023)

Question

At a certain rate of interest per annum, the difference between the compound interest and simple interest on ₹3,00,000 for two years is ₹480, then the rate of interest per annum is:

(a) 4% (b) 2% (c) 6% (d) 8%

(September 2024)

Question

The difference between compound interest and simple interest on a certain sum of money invest for three years at 6% per annum is 110.16. The principal is:

(a) ₹ 3,000 (b) ₹ 3,700

(c) ₹ 12,000 (d) ₹ 10,000 (1 mark)

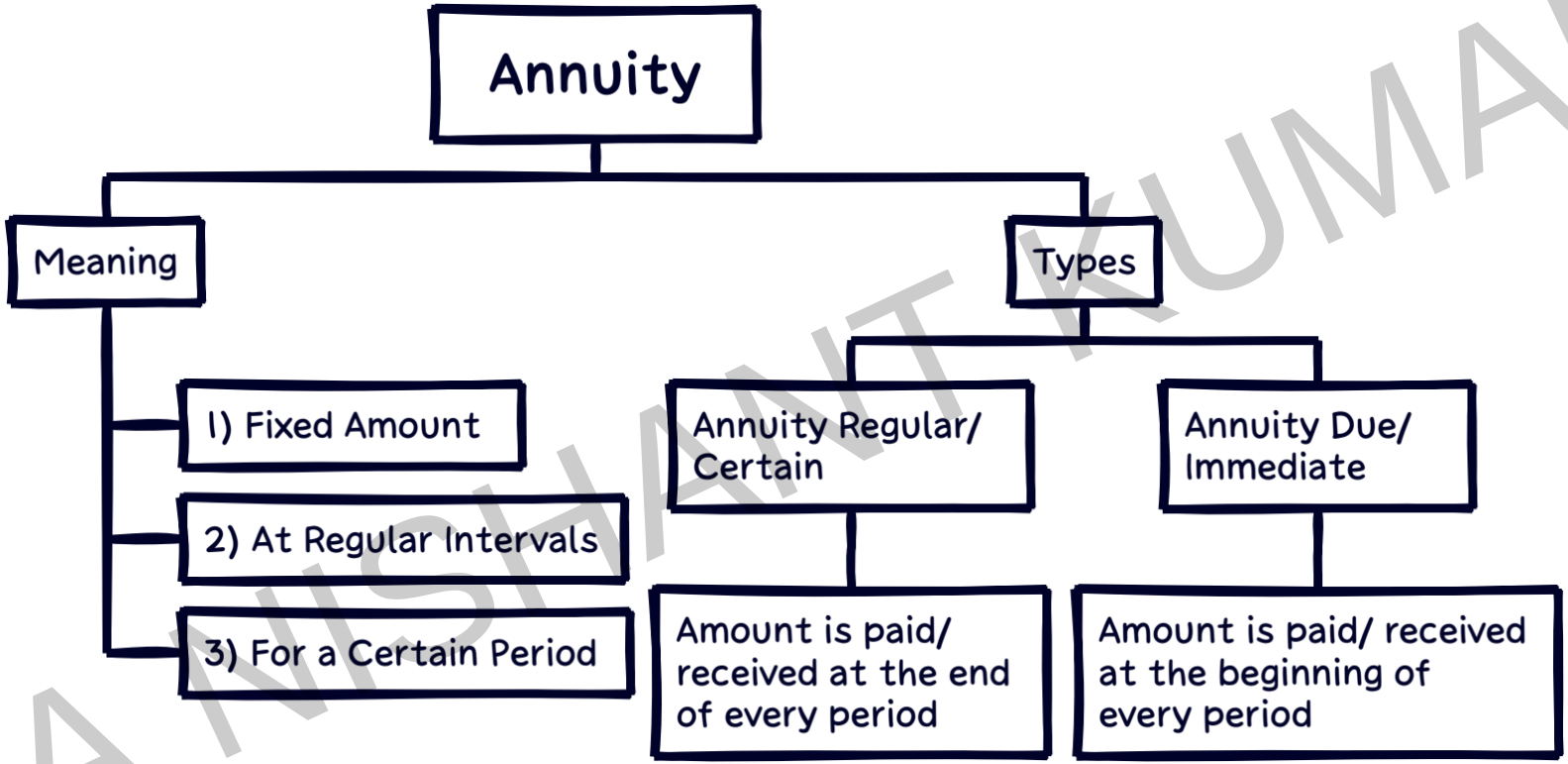
(June 2023)

Question

What is the effective rate of interest when principal amount of ₹50,000 deposited in a nationalized bank for one year, corresponding to a nominal rate of interest 6% per annum payable half-yearly?

(a) 6.07% (b) 6.06% (c) 6.08% (d) 6.09%

(September 2024)



Future Value of Annuity Regular

$$FV = A\left[\frac{\left(1+\frac{i}{NOCPPY}\right)^{t\times NOCPPY}-1}{\frac{i}{NOCPPY}}\right]$$

Application - Sinking Fund

The amount required from the Sinking Fund is the Future Value of Annuity

Future Value of Annuity Due

$$FV = A\left[\left(\frac{\left(1+\frac{i}{NOCPPY}\right)^{t\times NOCPPY}-1}{\frac{i}{NOCPPY}}\right)\times\left(1+\frac{i}{NOCPPY}\right)\right]$$

Question

What is the annual contribution required by an organization to accumulate ₹20,00,000 in ten years for the construction of a new manufacturing plant, utilizing a sinking fund with an annual interest rate of 6% compounded annually? $\left[\text{Where } A(10, 0.06) = 13.180785\right]$

(a) ₹1,67,440.90 (b) ₹1,51,736.03 (c) ₹1,75,433.60 (d) ₹1,83,714.28

(September 2024)

Question

In an account paying interest @ 9% per year compounded monthly, ₹200 is invested at the end of each month. What is the future value of this annuity after 10^{th} payment? $\left[\text{Where } (1.0075)^{10} = 1.0775\right]$

(a) ₹2,066 (b) ₹1,022 (c) ₹2,044 (d) ₹2,155

(September 2024)

Question

Find the future value of an annuity of ₹ 5,000 made annually for 6 years at interest rate of 12% compounded annually. If (1+ 0.12) =1.9738.

(a) ₹ 45,575 (b) ₹ 40,575

(c) ₹ 39,465 (d) ₹ 37,868 (1 mark)

(June 2024)

Question

What will be the future value of an annuity of ₹ 2,500 made annually for 12 years at interest rate of 5% compounded annually if $(1.05)^{12} = 1.7958$

(a) ₹ 37,588.58 (b) ₹ 39,790.00

(c) ₹ 40,873.13 (d) ₹ 42,603.68 (1 mark)

(December 2023)

Question

Suppose Mr. X invested ₹ 5,000 every year starting from today in mutual fund for next 10 years. Assuming that average return compounded annually is at 18% per annum. What is future value?

(a) ₹ 1,83,677.68 (b) ₹ 1,38,678.85

(c) ₹ 1,83,776.53 (d) ₹ 1,38,774.55 (1 mark)

(December 2023)

Question

How much amount is required to be invested every year so as to accumulate ₹ 30,000 at the end of 10 years if the interest compounded annually at 10%. Given A(100.1) = 15.9374

(a) ₹ 1,882.36 (b) ₹ 1,828.30

(c) ₹ 1,832.65 (d) ₹ 1,853.65 (1 mark)

(December 2023)

Question

What is the annual contribution required by an organization to accumulate ₹20,00,000 in ten years for the construction of a new manufacturing plant, utilizing a sinking fund with an annual interest rate of 6% compounded annually? $\left[\text{Where } A(10, 0.06) = 13.180785\right]$

(a) ₹1,67,440.90 (b) ₹1,51,736.03 (c) ₹1,75,433.60 (d) ₹1,83,714.28

(September 2024)

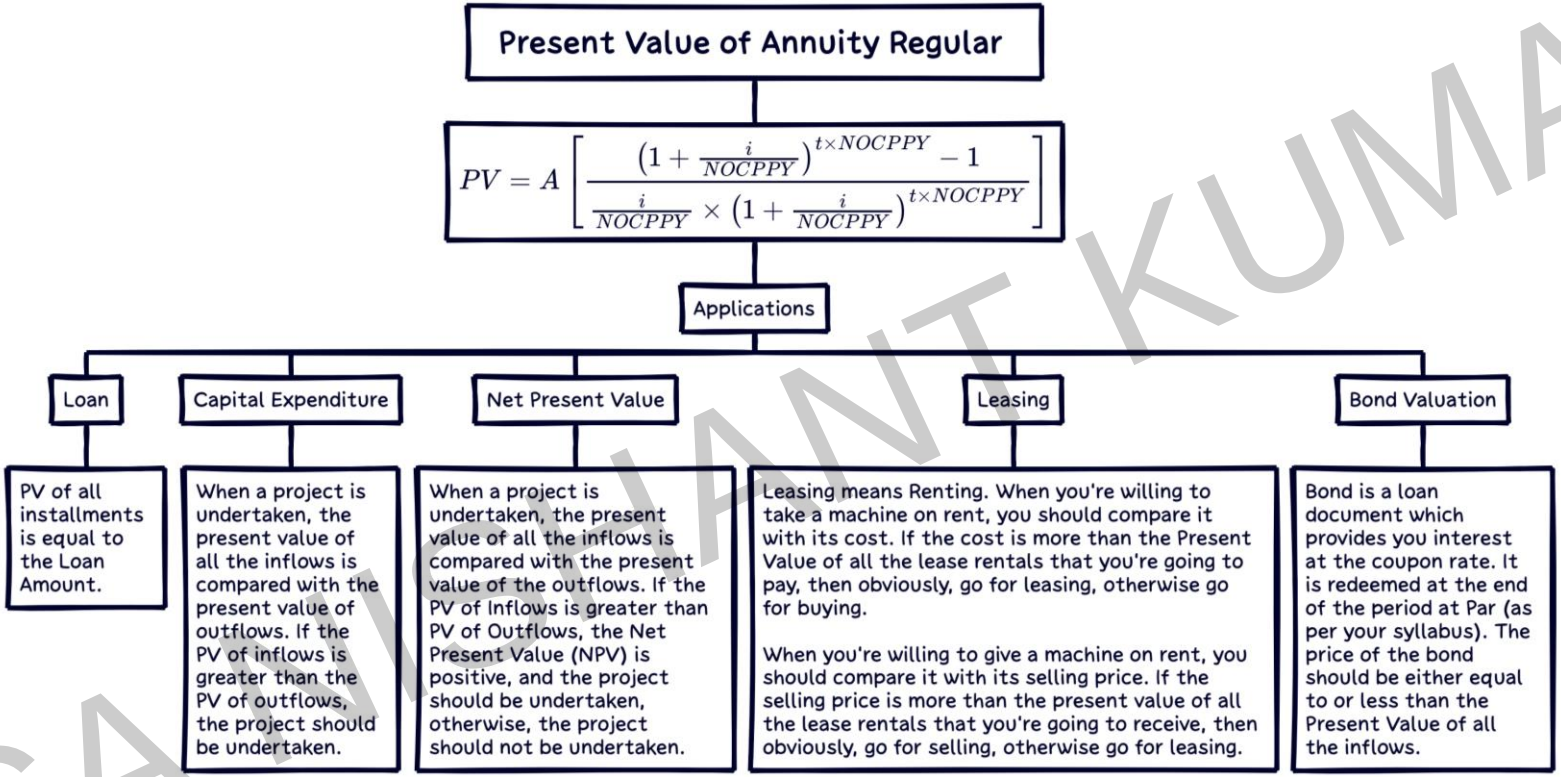
Question

Suppose you have decided to make a systematic investment plan (SIP) inn a mutual fund with ₹1,00,000 every year from today for next 10 years at the rate of 10% per annum compounded annually. What is the future value of this annuity? Given $1.1^{10} = 2.59374$

(a) ₹ 17,35,114
(b) ₹ 17,53,411
(c) ₹ 17,35,411
(d) ₹ 17,53,114

(1 mark)

(June 2023)



Present Value of Annuity Due

PV of Annuity Due = Initial Receipt/ Payment +
PV of Annuity Regular for (n - 1) periods

Question

A loan of ₹16,550 is to be paid in three equal annual installments at compound interest. The value of annual instalment, if the rate of interest is 10% per annum is:

(a) ₹1,243 (b) ₹6,665 (c) ₹6,565 (d) ₹1,343

(September 2024)

Question

If a loan of ₹ 30,000 is to be paid in 5 annual instalments with interest rate of 14% per annum, then the equal annual instalment will be _____. (Take P (5.0.14) = 3.43308):

(a) ₹ 7,400 (b) ₹ 8,100

(c) ₹ 8,735 (d) ₹ 8,322 (1 mark)

(June 2024)

Question

Mrs. X invests in an annuity immediately that promises annual payments of ₹ 50,000 for the next 15 years. If the interest rate is 6% compounded annually then the approximate present value of this annuity is _____, where$(1.06)^{16} = 2.54035$.

(a) ₹ 5,51,217.75 (b) ₹ 5,75,900.00

(c) ₹ 5,05,288.08 (d) ₹ 5,35,612.45 (1 mark)

(December 2023)

Question

A person wants to open a shop have two options to acquire a commercial space either by leasing for 10 years at annual rent of ₹ 2,00,000 or by purchasing the space for ₹ 12,00,000. If person can borrow money at 14% compounded per annum. Which alternate is most suitable? Given P(100.14) = 5.21611

(a) Leasing
(b) Purchase
(c) Can't say
(d) Data insufficient

(1 mark)

(December 2023)

Question

Govinda's mother decides to gift him ₹50,000 every year starting from today for the next 5 year. Govinda deposits this amount in a bank. As and when he receives and gets 10% per annum interest rate compounded annually. What is the present value of this annuity? Given P (4, 0.10) = 3.16987

(a) ₹ 2,80,493.5 (b) ₹ 2,08,993.5

(c) ₹ 2,08,493.5 (d) ₹ 2,58,493.5 (1 mark)

(June 2023)

Question

A car is available for ₹4,98,200 cash payment on ₹60,000 cash down payment followed by three equal annual installment of the rate of interest charged is 14% per annum compounded yearly. These total interest charged in the instalment plans is (Given P (3,0.14) = 2.32163)

(a) ₹ 1,46,314
(b) ₹ 1,46,137
(c) ₹ 1,28,040
(d) ₹ 1,58,040

(1 mark)

(June 2023)

Question

ABC Ltd. wants to lease out an asset costing ₹ 3,60,000 for a five year period. It has a fixed rental of ₹ 1,05,000, per annum payable annually starting from the end of first year. Suppose rate of interest is 14% per annum compounded annually on which money can be invested by the company. Is this agreement favourable to the company?

(a) Yes (b) No

(c) Can't Say (d) None (1 mark)

(June 2022)

Question

An investor intends to purchase a three-year ₹1,000 par value bond having nominal interest rate of 10%. At what price the bond may be purchased now, if it matures at par and the investor requires a rate of return of 14%?

(a) ₹907.125 (b) ₹904 (c) ₹905.25 (d) ₹909

(September 2024)

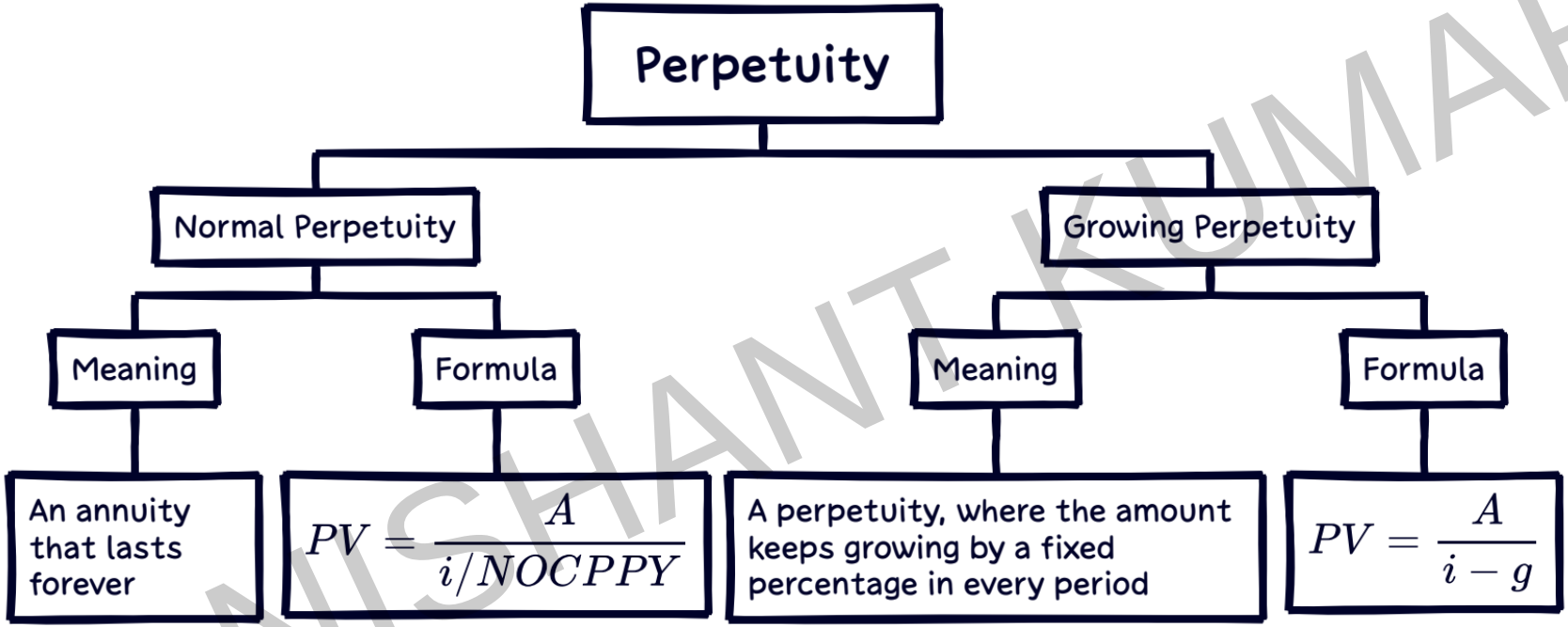
Question

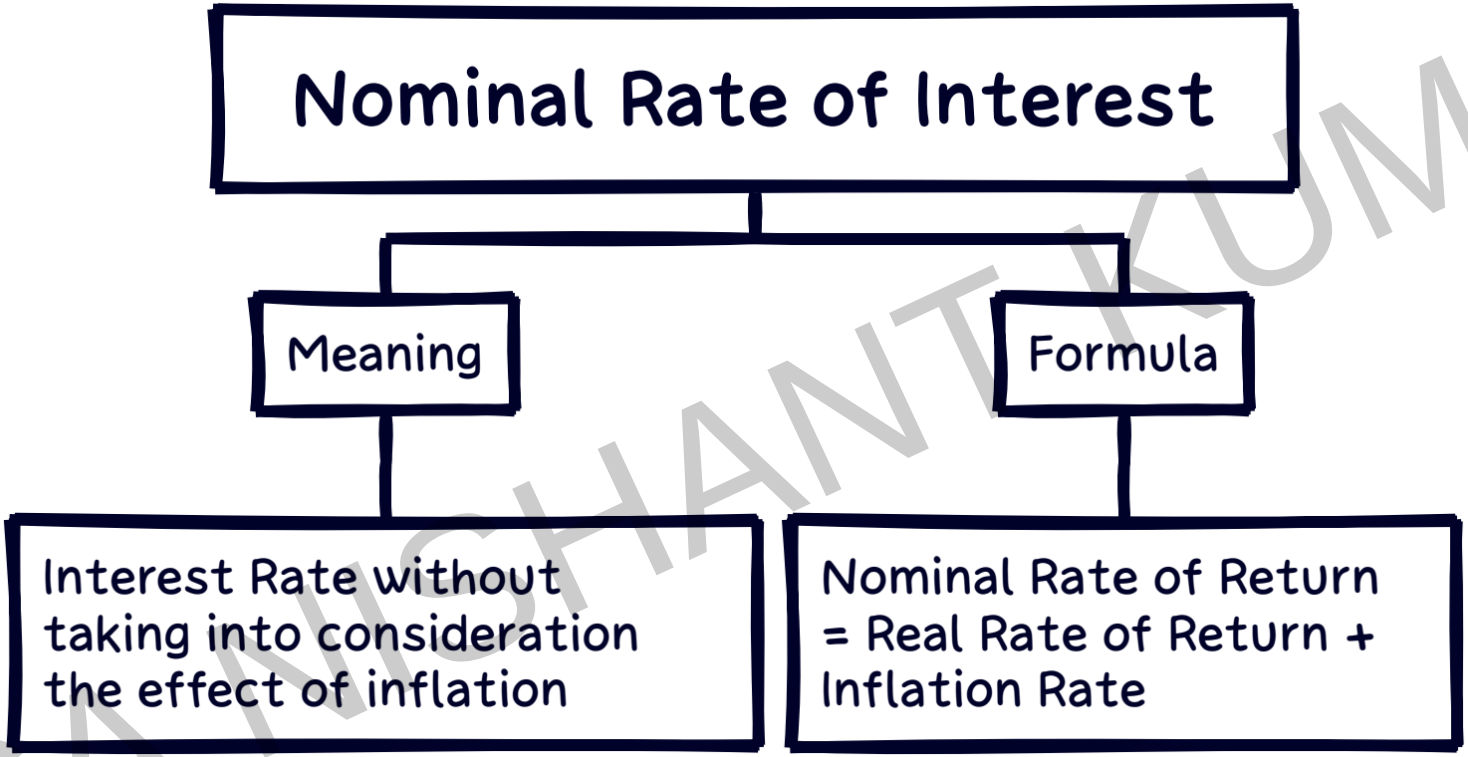
If the cost of capital be 12% per annual, then the net present value (in nearest ₹) from the given cash flow is given as:

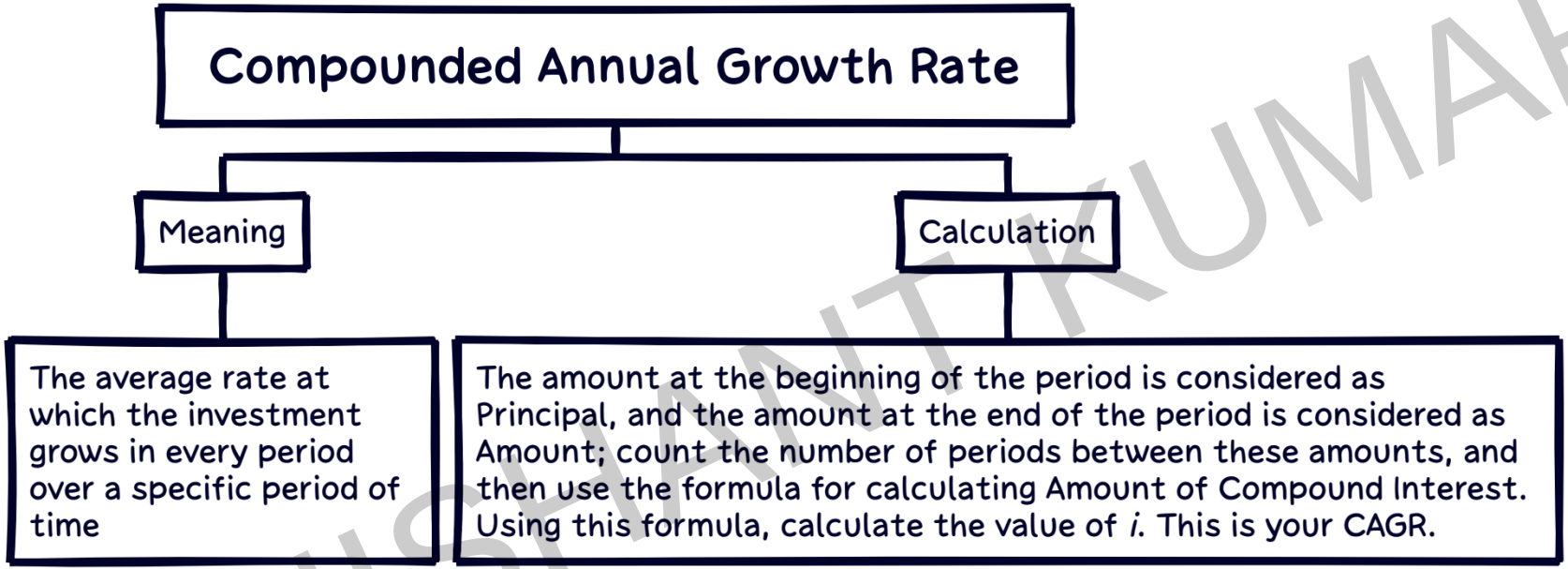
Years	0	1	2	3
Operating profit (in thousands ₹)	(100)	60	40	50

(a) 31,048 (b) 34,185
(c) 21,048 (d) 24,187 (1 mark)

(July 2021)







Question

A Perpetuity has a cash flow of ₹625 and a required rate of return of 8%. If the cash flow is expected to grow at a constant rate of 4% per year, then the intrinsic value of this perpetuity (present value of growing perpetuity) is:

(a) ₹13,000 (b) ₹15,625 (c) ₹14,250 (d) ₹16,667

(September 2024)

Question

The Earning Per Share (EPS) of a company for five years is given below:

Year	2019	2020	2021	2022	2023
EPS	40	25	40	60	90

Calculate Compounded Annual Growth Rate (CAGR) of EPS.

(a) 23.47% (b) 24.47% (c) 22.47% (d) 21.47%

(September 2024)

Question

Let the operating profit of a manufacturer for five years is given as:

Years	1	2	3	4	5	6
Operating Profit (in lakh ₹)	90	100	106.4	107.14	120.24	157.34

The Compound Annual Growth Rate (CAGR) of Operating Profit for year 6 with respect to year 2 is:

(a) 9% (b) 12% (c) 11% (d) 13%

(July, 2021)

Question

The CAGR of initial value of an investment of ₹15,000 and final value of ₹25,000 in 3 years is:

(a) 19% (b) 18.56% (c) 17.56% (d) 17%

(June, 2022)

Question

10 years ago, the earning per share (EPS) of ABC Ltd. was ₹5 share its EPS for this year is ₹22. Compute at what rate, EPS of the company grows annually?

(a) 15.97% (b) 16.77% (c) 18.64% (d) 14.79%

(December, 2022)

Question

The nominal rate of growth is 17% and inflation is 9% for the five years. Let P be the Gross Domestic Product (GDP) amount at the present year, then the projected real GDP after 6 years is:

(a) 1.587P (b) 1.921P (c) 1.403P (d) 2.51P

(July 2021)

Question

If a person bought a house by paying ₹45,00,000 down payment and ₹80,000 at the end of each year till the perpetuity. Assuming the rate of interest as 16% the present value of house (in ₹) is given as:

(a) 47,00,000 (b) 45,00,000 (c) 57,80,000 (d) 50,00,000

(July, 2021)

Question

A stock pays annually an amount of ₹10 from 6^{th} year onwards. What is the present value of the perpetuity, if the rate of return is 20%?

(a) 20.1 (b) 19.1 (c) 21.1 (d) 22.1

(December 2020)

Question

If the discount rate is 14% per annum, then how much a company has to pay to receive ₹280 growing at 9% annually forever?

(a) ₹5,600 (b) ₹2,800 (c) ₹1,400 (d) ₹4,200

(MTP December, 2023 – Series I; July, 2021)