

CAGR, DEPRECIATION

1 MARK QUESTIONS

- The CAGR of an investment, whose starting value is Rs. 5,000 and it grows to Rs. 25,000 in 4 years, is : [Given $(5)^{0.25} = 1.4953$]
(A) 49.53% (B) 14.95% (C) 495.3% (D) 1.49%
[March, 2025]
- A mobile phone costs Rs. 12,000 and its scrap value after a useful life of 3 years is Rs. 3,000. Then, the book value of the mobile phone at the end of 2 years is :
(A) Rs. 3,000 (B) Rs. 6,000 (C) Rs. 5,000 (D) Rs. 7,000
[March, 2025]
- If the annual depreciation of an asset is ₹ 40,000 and its scrap value after useful life of 15 years is ₹ 50,000, then the original cost of the asset is :
(A) ₹ 7,60,000 (B) ₹ 7,20,000 (C) ₹ 6,50,000 (D) ₹ 6,30,000
[July, 2024]
- An investment's starting value is ₹ 10,000 and it grows to ₹ 60,000 in 4 years. The CAGR is :
(Given : $(6)^{\frac{1}{4}} = 1.56508$)
(A) 1.56% (B) 5.65% (C) 15.65% (D) 56.50%
[July, 2024]
- The original cost of a machine is ₹ 1200000 and the scarp value of the machine after a useful life of 3 years is ₹ 300000, then the book value of the machine at the end 2 years is
(A) ₹ 100000 (B) ₹ 250000 (C) ₹ 600000 (D) ₹ 800000
[SQP 24-25]
- A machine costing ₹ 30,000 is expected to have a useful life of 4 years and a final scrap value of ₹ 4000. The annual depreciation is
(a) ₹ 5500 (b) ₹ 6500 (c) ₹ 7500 (d) ₹ 8500
[SQP 23-24]
- If the investment of ₹ 20000 in the mutual fund in 2015 increased to ₹ 32000 in year 2020, then CAGR (Compound Annual Growth rate is) is [Use : $(1.6)^{\frac{1}{5}} = 1.098$]
(a) 9.08% (b) 9.8% (c) 0.098% (d) 0.09%
[SQP 23-24]
- An investment of ₹ 10,000 becomes ₹ 60,000 in 4 years, then the CAGR (compound annual growth rate) is given by –
(A) $\frac{\sqrt[4]{6} - 1}{100}$ (B) $\frac{\sqrt[4]{6} + 1}{100}$ (C) $[\sqrt[4]{6} - 1] \times 100$ (D) $[\sqrt[4]{6} + 1] \times 100$
[SQP 22-23]

2 MARKS QUESTIONS

- Assume an investment's starting value is Rs. 20,000 and it grows to Rs. 50,000 in 3 years. Calculate CAGR (Compounded Annual Growth Rate) [Use : $(2.5)^{\frac{1}{3}} = 1.355$]
[March, 2024]
- Abhay bought a mobile phone for Rs. 30,000. The mobile phone is estimated to have a scrap value of Rs. 3,000 after a span of 3 years. Using the linear depreciation method, find the book value of the mobile phone at the end of 2 years.
[March, 2022]
- The value of a machine purchased two years ago, depreciates at the annual rate of 10%. If its present value is Rs. 97,200, find.
(i) its value after 3 years;

(ii) its value when it was purchased.

[July, 2023]

12. The revenue of a company over a period are given as follows:

Year	2015	2016	2017	2018
Revenue (in thousands Rs.)	100	115	150	200

Calculate CAGR over the 3-year period spanning the end of 2015 to the end of 2018.

[Given : $(2)^{\frac{1}{3}} = 1.26$]

[July, 2022]

13. The population of a town increases from 75,000 to 1,25,000 over a period of time. If the compound annual growth rate is 5%, calculate the number of complete years it will take for the population to grow from 75,000 to 1,25,000. [Use $\log(1.67) = 0.223$ and $\log(1.05) = 0.021$]

[SQP 25-26]

14. A bond having a face or maturity value of ₹ 56,000, redeemable at par in 6 years carries a coupon rate of 7% p.a., to be paid quarterly. Find the purchase price of the bond if effective yield rate is to be 9% p.a., compounded quarterly. [Use $(1.0225)^{-24} = 0.58$]

[SQP 25-26]

3 MARKS QUESTIONS

15. A recent accounting graduate opened a new business and installed a computer system that costs Rs. 45,200. The computer system will be depreciated linearly over 3 years and will have a scrap value of Rs. 0.

(i) What is the rate of depreciation ?

(ii) Give a linear equation that describes the computer system's book value at the end of t^{th} year, where $0 \leq t \leq 3$

(iii) What will be the computer system's book value at the end of the first year and a half ?

[March, 2024]

16. An asset costs Rs. 4,50,000 with an estimated useful life of 5 years and a scrap value of Rs. 1,00,000. Using linear depreciation method, find the annual depreciation of the asset and construct a yearly depreciation schedule.

[March, 2023]

17. A person invested ₹ 5,000 in a fund for 5 years. The value of the investment was ₹ 4,800 at the end of the second year, ₹ 6,000 at the end of the third year, ₹ 6,700 at the end of the fourth year and on maturity, the final investment sold at ₹ 8,000. Find the CAGR. [Use : $(1.6)^{\frac{1}{5}} = 1.098$]

[July, 2025]

18. The annual depreciation of an asset is ₹ 50,000 and its scrap value after useful life of 10 years is ₹ 60,000. Find the original cost of the asset, using linear depreciation method.

[July, 2025]

19. A machine costing ₹ 2,00,000 has effective life of 7 years and its scrap value is ₹ 30,000. What amount should the company put into a sinking fund earning 5% p.a. so that it can replace the machine after its useful life ? Assume that a new machine will cost ₹ 3,00,000 after 7 years. [Given : $(1.05)^7 = 1.407$]

[July, 2024]

20. The value of a car depreciates by 12.5% every year. By what percent will the value of the car decrease after 3 years and after 5 years ?

[July, 2024]

21. Mr Rohit invested ₹ 5000 in a fund at the beginning of year 2021 and by the end of year 2021 his investment was worth ₹ 9000. Next year market crashed and he lost ₹ 3000 and ending up with ₹ 6000 at the end of year 2022. Next year i.e. 2023 he gained ₹ 4500 and ending up with ₹ 10500 at

the end of the year. Find CAGR (Compounded Annual Growth Rate) of his investment. (Use $(2.1)^{1/3} = 1.2805$)

[SQP 24-25]

22. A person invested ₹15000 in a mutual fund and the value of investment at the time of redemption was ₹25000. If CAGR for this investment is 8.88%, Calculate the time period for which the amount was invested? [Given $\log(1.667) = 0.2219$ & $\log(1.089) = 0.037$]

[SQP 21-22]

5 MARKS QUESTIONS

23. Define Compound Annual Growth Rate (CAGR) and give the formula for investment given below :

Vikas invested Rs. 10,000 in a stock of a company for 6 years. The value of his investment at the end of each year is given below :

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Rs. 11,000	Rs. 11,500	Rs.11,650	Rs. 11,800	Rs. 12,200	Rs. 14,000

[Use : $(1.4)^{\frac{1}{6}} = 1.058$] [5M]

[March, 2023]

24. A firm bought a machinery for Rs. 7,40,000 on 1st April, 2020 and Rs. 60,000 is spent on its installation. Its useful life is estimated to be of 5 years. Its scrap value at the end of 5 years is estimated to be Rs. 40,000. Find the amount of annual depreciation and the rate of depreciation.

[July, 2023]

CASE-BASED QUESTIONS

25. A start-up company invested Rs. 3,00,000 in shares for 5 years. The value of this investment was Rs. 3,50,000 at the end of second year, Rs. 3,80,000 at the end of third year and on maturity, the final value stood at Rs. 4,50,000. Calculate the Compound Annual Growth Rate (CAGR) on the investment.

[Use : $(1.5)^{\frac{1}{5}} = 1.084$]

[March, 2022]

26. Mrs. Jain is considering to buy a Rs. 1,000 par value bond bearing a coupon rate of 11% that matures after 5 years. She wants a minimum rate of return of 15%. The bond is currently sold at Rs. 870. Should she buy the bond? Justify your answer. $[(1.15)^{-5} = 0.4971]$ [BOND QUESTION]

[July, 2022]

27. A music band company has gained much popularity all over the country. They buy a bus to travel to their destinations. The purchase price of the bus is Rs. 88,50,000. The bus will be depreciated linearly over 10 years and will have a scrap value of Rs. 25,50,000.

(i) Determine the rate of depreciation.

(ii) Determine the book value of the bus at the end of 5 years.

(iii) When will the bus be worth Rs. 44,40,000?

[July, 2022]