

TIME VALUE OF MONEY

Question #1**Basic FV**

₹ 2,000 is invested at annual rate of interest of 10%. What is the amount after 2 years if the compounding is done?

(a) Annually? (b) Semi-annually? (c) Monthly? (d) Daily?

[Given: $(1.00833)^{24} = 1.22029$; $(1.000274)^{730} = 1.22139$]

Question #2**Basic FV (solve for rate)**

What annual rate of interest compounded annually doubles an investment in 7 years?

[Given that $2^{1/7} = 1.104090$].

Question #3**Basic Future Value (FV) Computation**

A person opened an account on April, 2018 with a deposit of ₹ 800. The account paid 6% interest compounded quarterly. On October 1, 2018, he closed the account and added enough additional money to invest in a 6-month Time Deposit for ₹ 1,000 earning 6% compounded monthly.

- How much additional amount did the person invest on October 1?
- What was the maturity value of his Time Deposit on April 1, 2019?
- How much total interest was earned?

Question #4**Basic Present Value (PV) Computation**

Find the present value of ₹ 10,000 to be required after 5 years if the interest rate be 9 per cent.

Question #5**Future Value of Annuities (FVA)**

Find the amount of an annuity if payment of ₹ 500 is made annually for 7 years at interest rate of 14% compounded annually.

Question #6**Future Value of Annuities (FVA)**

₹ 200 is invested at the end of each month in an account paying interest 6% per year compounded monthly. What is the amount of this annuity after 10th payment?

Question #7**Present Value of Annuities (PVA)**

Find out the present value of a 4 year annuity of ₹ 20,000 discounted at 10 per cent.



Question #8 Present Value of Annuities (PVA)

Y bought a TV costing ₹ 13,000 by making a down payment of ₹ 3,000 and agreeing to make equal annual payment for 4 years. How much would be each payment if the interest on unpaid amount be 14% compounded annually?

Question #9 Present Value of Annuities (PVA)

Z plans to receive an annuity of ₹ 5,000 semi-annually for 10 years after he retires in 18 years. Money is worth 9% compounded semi-annually.

- (a) How much amount is required to finance the annuity?
- (b) What amount of single deposit made now would provide the funds for the annuity?
- (c) How much will Mr Z receive from the annuity?

[Given: $(1.045)^{36} = 4.8774$]

Question #10 Future Value of Annuities (FVA)

ABCL Company has issued debentures of ₹ 50 lakhs to be repaid after 7 years. How much should the company invest in a sinking fund earning 12 percent in order to be able to repay debentures?

Question #11 Present Value of Annuities (PVA)

Mr A wants to pay all his 12 monthly rentals at once against his monthly rental of ₹ 15,000 which is payable in advance. You may assume a discount rate of 12% pa. Find out the amount that Mr A shall have to pay today in lieu of all his rentals.

Question #12 Perpetuities

Ramesh wants to retire and receive ₹ 3,000 a month. He wants to pass this monthly payment to future generations after his death. He can earn an interest of 8% pa. How much will he need to set aside to achieve his perpetuity goal?

Question #13 Growing perpetuity

Assuming that the discount rate is 7% per annum, how much would you pay to receive ₹ 50, growing at 5%, annually, forever?

Question #14 Effective rate computation

If the interest is 10% payable quarterly, find the effective rate of interest.

Question #15**Nominal–effective conversion**

Bank of Delhi pays 8 per cent interest, compounded quarterly, on its money market account. The managers of Bank of Gurgaon want its money market account to equal Bank of Delhi's effective annual rate, but interest is to be compounded on monthly basis. What nominal, or quoted, or APR rate must Bank of Gurgaon set?

[Given: $(1.0824)^{1/12} = 1.00662$ & $(1.02)^{1/3} = 1.00662$]

Question #16**Continuous Compounding**

Calculate future value of ₹ 10,000 invested today @ 10% continuously compounded for next 3 years.

[Given: $e^{0.30} = 1.3499$]



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