MANIPAL INSTITUTE OF TECHNOLOGY
BENGALURU
(A constituent unit of MAHE, Manipal)

VI Semester MIDTERM RETEST-(APRIL 2025)

Engineering Economics and Financial Management (HUM_3021/HUM_3151)

Time Duration: 2 Hours **Date: 08/04/2025** **Max marks: 30 Marks**

Q. No.	Topic	Marks	BL	CO
1	If a lender charges 12% interest, compounded quarterly, what effective annual interest rate is the lender charging? a) 12.55 % b) 12.68 % c) 12.75 % d) None of the above	01	Apply	1
2	If a lender charges 12% interest, compounded monthly, what is the effective interest rate per quarter? a) 42.58 % b) 12.49 % c) 0.75 % d) None of the above	01	Apply	1
3	Suppose you want to save some money for your get-together party. You have deposited ₹1,000 in the bank on January 01, 2016. Later, you added ₹2,000 on January 01, 2019, and ₹3,000 on January 01, 2022. If the bank gives 8% interest every year, how much will you have on January 1, 2026? a) ₹8768 b) ₹7865 c) ₹9668 d) None of the above	01	Apply	2
4	What is the Present Worth at 5% interest of a series of ₹20,000 payments every 25 years (forever)? The first payment occurs 25 years from now. a) ₹8,400 b) ₹16,000 c) ₹28,400 d) None of the above	01	Apply	2
5	A machine has no repair cost in the first quarter. In the second quarter, the cost is ₹5,000, and it increases by ₹5,000 every quarter after that for 3 years. If the interest rate is 12% per year compounded quarterly, what would be the equal quarterly payment over the 3 years that matches this cost? a) ₹15742	01	Apply	1

	b) ₹20742 c) ₹25742 d) ₹30742			
6	A person invested ₹15,000 in his high-yield account on December 31, 1995. He will close his account on December 31, 2025, and will receive ₹5,39,250. Compute the effective interest rate he received on the account. a) 12.55 % b) 12.68 % c) 12.75 % d) None of the above	01	Apply	1
7	MAHE BLRU's RUBARU costs ₹10 lakh every year. Just before this year's Rubaru, the organizing committee determined that it had ₹60 lakh in an account paying 8% interest. After this year, how many more RUBARUs can be sponsored without raising more money? Think carefully! a) 5 b) 6 c) 7 d) None of the above	01	Apply	1
8	Virat Sharma has purchased a cycle costing ₹12,500. After five years, it is estimated to have a salvage value of ₹4,000. Maintenance costs are estimated to be ₹0 for the first year and will increase by ₹100 each year thereafter. If a 12% interest rate is used, calculate the equivalent uniform annual cost. a) ₹2,925 b) ₹2,975 c) ₹3,015 d) None of the above	01	Apply	1
9	Given a situation where the annual interest rate is 5% when continuous compounding is used rather than monthly compounding, the nominal interest rate a) Increases b) Decreases c) Remains the same d) None of the above	01	Understand	1
10	Consider two investments: 1. Invest ₹1,000 and receive ₹110 at the end of each month for the next 10 months. 2. Invest ₹1,200 and receive ₹130 at the end of each month for the next 10 months. If this were your money, and you want to earn at least 12% interest on your money, which investment would you make, if any?	01	Understand	2

	a) Investment 1 b) Investment 2 c) Both Investments d) None of the above			
11 (a)	You wish to endow a scholarship to MIT BLR in the name of your favourite professor. The scholarship is to provide ₹40,000/- per year for the first 5 years and ₹1,00,000/- per year thereafter. If MIT BLR expects to be able to earn 10% per year on the endowment, how much money must you give now if the first scholarship is to be given 1 year from now?	03	Apply	2
11 (b)	A certain operation is now being carried on with machine 'E', whose present salvage value is ₹2000/-. The future life of machine E is estimated at 5 years, at the end of which its salvage value is calculated as Zero. Operating costs with machine E are estimated at ₹1200/- per year. It is expected that machine E will be replaced after 5 years by machine F, whose initial cost, life final salvage value, and annual operating costs are estimated to be ₹10000/-, 15 years, Zero, and ₹600/-, respectively. The desirability of replacing machine E with machine G is being considered. Machine G's initial cost, life, salvage value, and annual operating costs are estimated to be ₹8000/-, 15 years, Zero, and ₹900/-, respectively. The interest rate is 10% per annum. Using a study period approach of 15 years conduct the replacement analysis a) recognizing the unused value and b) not recognizing the unused value.	05	Analyze	3
11 (c)	You deposit ₹10,000 in an account. For the first 3 years, it earns 12% interest compounded monthly. Then, for the next 2 years, it earns 15% interest compounded semiannually. How much money will you have after 5 years?	02	Apply	2
12 (a)	As a two-wheeler owner, you have two options. Either you can buy new tubeless tyres or have the worn-out tyres recapped. Tubeless tyres for the vehicle will cost ₹2000 each and will last 40000 kilometres. The old tyres can be recapped for ₹800 each and will last only for 20000 kilometres. The salvage value of these tyres is zero. Since the vehicle is very old, it will register only 2500 kilometres every six months. If the tubeless tyres are purchased, the vehicle's mileage will increase by 20%. If the cost of petrol is ₹100/litre and the bike gets 50 kilometres/litre, compare and recommend the types of tyres you will prefer for your vehicle using the present worth method. Consider the rate of interest as 12% per annum.	05	Evaluate	2

12 (b)	Before evaluating the economic merits of a proposed investment, the XYZ corporation insists that its engineers develop a cash-flow diagram of the proposal. An investment of ₹10,000 can be made that will produce uniform annual revenue of ₹5,310 for five years and then have a market (recovery) value of ₹2,000 at the end of year (EOY) five. Annual expenses will be ₹3,000 at the end of each year for operating and maintaining the project. Construct a cash-flow diagram for the five-year life of the project.	02	Apply	1
12 (c)	To receive a loan of ₹500 today and another ₹500 five years from today, you agree to pay ₹300 at the end of years 3, 6, and 9 and the remainder at the end of year 12. What is the final payment if interest is accrued at a nominal interest rate of 12% semiannually?	03	Apply	3
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