

MGM's College of Engineering, Nanded
Department of Computer Science & Engineering

Class: SE CSE-I

Assignment – I

Sub: EE

1. Define the following:
 - a) Time value of money
 - b) Interest Rate and Rate Of Return
 - c) Cash inflows, outflows and Net Cash Flow
 - d) Economic Equivalence
 - e) Minimum Attractive Rate of Return (MARR)
2. Emerson Processing borrowed \$900,000 for installing energy-efficient lighting and safety equipment. The terms of the loan were such that the company could pay interest only at the end of each year for up to 5 years, after which the company would have to pay the entire amount due. If the interest rate on the loan was 12% per year and the company paid only the interest for 4 years, determine the following: a) The amount of each of the four interest payments, b) The amount of the final payment at the end of year 5
3. A company that makes Ethernet adapters is planning to expand its production facility at a cost of \$1,000,000 one year from now. However, a contractor who needs work has offered to do the job for \$790,000 if the company will do the expansion now instead of 1 year from now. If the interest rate is 15% per year, how much of a discount is the company getting?
4. Derive the mathematical equations for Uniform Series Present Worth Factor (P/A) and Capital Recovery Factor (A/P).
5. How much can Titan, Inc., afford to spend now on an energy management system if the software will save the company \$21,300 per year for the next 5 years? Use an interest rate of 10% per year.
6. Derive the mathematical equations for arithmetic gradients series factors(P/G and A/G).
7. Derive the mathematical equation for geometric gradient series factor (P_g).
8. A family that won a \$100,000 prize on America's Funniest Home Videos decided to put one-half of the money in a college fund for their child. If the fund earned interest at 6% per year, how much was in the account 14 years after it was started?

9. If GHD Plastics purchases a new building now for \$1.3 million, what must the building be worth in 10 years? The company expects all expenditures to earn a rate of return of at least 18% per year.
10. Profits from recycling paper have increased at a constant rate of \$1100 in each of the last 3 years. If this year's profit (end of year 1) is expected to be \$6000 and the profit trend continues through year 5, a) what will the profit be at the end of year 5 and b) what is the present worth of the profit at an interest rate of 8% per year?
11. Apple Computer wants to have \$2.1 billion available 5 years from now. The company expects to set aside uniformly increasing amounts of money each year to meet its goal. If the amount set aside at the end of year 1 is \$50 million, how much will the constant increase G have to be each year? Assume the investment account grows at a rate of 18% per year.
12. Determine the present worth of a geometric gradient series with a cash flow of \$50,000 in year 1 and increases of 6% each year through year 8. The interest rate is 10% per year.
13. Determine the present worth of a maintenance contract that has a cost of \$30,000 in year 1 and annual increases of 6% per year for 10 years. Use an interest rate of 6% per year.
14. Determine the difference in the present worth values of the following two commodity contracts at an interest rate of 8% per year. Contract 1 has a cost of \$10,000 in year 1; costs will escalate at a rate of 4% per year for 10 years. Contract 2 has the same cost in year 1, but costs will escalate at 6% per year for 11 years.
15. The president of Ford Motor Company wants to know the equivalent future worth of a \$1 million capital investment each year for 8 years, starting 1 year from now. Ford capital earns at a rate of 14% per year.
16. Write and explain the steps for performing an engineering economy study.

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