Mid-West University

Examinations Management Office

Semester End Examinations 2081

Bachelor level/ B.E. Civil/ 5th Semester — Full Marks: 50

Time: 3 hours — Pass Marks: 25

Subject: Engineering Economics (MS401/MS451)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Use of Interest table and MACRS table allowed.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*

1. Briefly explain the origin and principles of engineering economics. **[4]**

2. A man wants to have Rs. 50,00,000 for the study of his son after the period of 20 years. How much money should he deposit each year for 20 years that earns 8 % interest annually? **[3]**

3. The project starts from Rs 3,00,000 at the end of first year and decreased by 3000 per year for 15 years. Find the equivalent present worth and annual worth if MARR = 15 %? **[3]**

4. From the following cash flow calculate the discounted payback period. (Standard Payback Period is 4 years) **[2]**

EOY	0	1	2	3	4	5
Cash Flow	-6000	2000	2000	2000	3000	3500

5. Compute IRR of the following project with initial investment of Rs. 5,00,000 and the salvage value of Rs 1,00,000 at the end of 5 years. The annual cash flows are as follows. Also draw investment balance diagram. **[4]**

End of year	Benefit	Cash inflow
1	1,05,000	5,000
2	1,15,000	10,000
3	1,25,000	15,000
4	1,35,000	20,000
5	1,45,000	25,000

6. The first investment cost for a project is Rs 5,00,000. The net annual revenue from the end of first year onwards are 3,00,000, 2,50,000, 2,00,000, 1,50,000 and 50,000 for five years. Determine whether the investment is feasible or not if MARR is 15 %. Use PW method. **[4]**

7. Consider the cash flows for the following investment projects.

	Project Cash flow			
	A	B	C	D
Initial Investment	1100	1500	2750	2000
Annual Income	500	700	1200	950
Useful Life	4	4	4	4
Salvage Value	250	500	800	1000

Suppose A, B, C, D are mutually exclusive projects. Which project would be selected based on the IRR criterion if MARR= 12 %? **[4]**

8. By using repeatability method select the best project if MARR=15% per year. **[4]**

Projects	A	B	C
Initial Investment (P)	100,000	200,000	250,000
Annual Expenditure	25,000	20,000	15,000
Useful life (N)	3	5	7
Salvage Value (Rs)	40,000	50,000	60,000

9. Perform sensitivity analysis of the following project over a range of ±15% in i) MARR ii) net annual revenue iii) useful life. Draw also sensitivity diagram. **[5]**

Initial Investment (Rs)	25000
Annual Revenue (Rs)	12000
Annual Expenses	4000
Salvage Value (Rs)	5000
Useful life	5 years
MARR	10%

10. Determine breakeven level of output and required output for the net profit Rs 5,00,000 from the following information. **[4]**

Total cost= Rs. 4,00,000

Total Fixed Cost= Rs 3,00,000

Sales Quantity= 1,000 units

Total Sales Amount= Rs. 5,00,000

11. If a machine has following information, compute the depreciation and book value of each year by i) SOYD ii) SL method **[4]**

Cost Basis	**Salvage Value**	**Life**	**MARR**
8,000	2,000	10 years	10 %

12. A company bought a machine at Rs. 25000 which is expected to produce benefit of Rs 8000 per year for five years. Its salvage value at the end of five years is Rs 10000. Calculate after tax cash flow if tax rate is 40 % and depreciation by MACRS method. **[4]**

13. What is inflation? Calculate the equipment present worth of the project from the following cash flow. Assume inflation free interest rate as 5 % and inflation as 10 % respectively. **[5]**

EOY	**Cash flow in Actual Dollar**
0	-7,50,000
1	3,20,000
2	3,75,000
3	3,28,000
4	2,90,000
5	5,80,000

The End