Mid-West University

Examinations Management Office

Semester End Examinations 2081

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

Time: 3 hours — **Pass Marks: 25**

Subject: Engineering Economics (SH451/SH509)

- *Attempt all the questions*
- *Figures in the margin indicate full marks.*
- *Assume suitable values, with a stipulation, if necessary.*
- *Candidates are required to answer the questions in their own words as far as possible.*
- *Students are allowed to carry log book*

1. Explain the roles of engineers in decision making. **[4]**
2. What is the effective interest rate of the nominal interest rate 9% per year, a 365 day year is used and compounding period is a) yearly b) quarterly c) daily d) Hourly e) Continuously? **[5]**
3. Calculate IRR of a commercial project constructed on a lease land with contract period of 5 years whose initial investment is Rs. 25,00,00,000, annual rent is Rs. 10,00,00,000, annual expense is Rs. 2,00,00,000 and is sold at Rs 5,00,00,000 to land owner after contract period and MRR=12% per year. **[5]**
4. Determine the investment decision of the following cash flow information by using AW method. What is the capital recovery (CR) cost of this project? Initial investment =Rs 100,000, Annual revenue=Rs 20,000, annual expenses=Rs 5000 salvage value=Rs25000, project life=10 years, MARR=10% per year. **[6]**
5. Find both types of B/C ratio using AW formulation. Initial investment: 20,000, annual benefit = 10000, annual cost= 4400, Salvage value=4000 Useful life: 5years MARR: 8% **[4]**
6. A machine having a cost of 36000 and estimated salvage value at the end of 5th year is 60000. Calculate depreciation charges per annum under sum of year digit method. **[4]**

   i. determine the choice between a defender that has a current market value of Rs 5000 and a challenger that can be purchased for 7500. Both have a service life of 3years with no salvage value at the end of life and MARR is 12%. Their operating costs are as following. **[5]**

Year	Defender (D)	Challenger (c)
1	1700	500
2	2000	1100
3	2500	1300

   ii. Determine the choice between defender and challenger with the following information by using the annual equivalent cost (AEC) approach when useful life is 5years and MARR is 10%. **[5]**

Item	Defender	Challenger
Initial investment	2500000	3500000
Annual cost	1000000	750000
Salvage value	500000	1200000

7. i. Perform **the sensitivity analysis** of the following projects over a range of ± 30% a) initial investment b) annual net revenue c) salvage value d) Useful life. Make sensitivity table. Given, Initial investment=Rs11500, net annual revenue (AR) =Rs3000. Salvage value =Rs1000. Useful life =6yrs, MARR=10 %. [4]

ii. from the data given below find the best suitable branch to expand using Risk tree analysis (Decision tree method) [4]

Business nature	Branch A		Branch B	
	Probability	Income	Probability	Income
High success	0.4	4000	0.4	4000
Media success	0.3	3500	0.2	3000
Low success	0.3	2500	0.4	2000

8. Write short note on; [4]

i. Corporate tax ii. VAT

The End