Mid-West University

Examinations Management Office

End Semester Examinations 2081

Bachelor level/ B.E. Hydropower/ 6th Semester — Full Marks: 50

Time: 3 hours — Pass Marks: 25

Subject: Engineering Economics (HE465/HE313)

- *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. Calculate the rate of inflation from the following information. **(4)**

Product	2020		2021	
	Price	quantity	Price	Quantity
pen	25	50	25	75
pencil	15	50	15	75
marker	35	50	35	75

2. If you make equal monthly deposits of Rs. 10000 into the bank for 10 years, saving accounts that pay you interest rate of 6% compounded monthly, what would be the amount at the end of 12 years? **(6)**

3. a) Find both type of B/C ratios by using AW method initial investment: 20,000 annual benefit: 10,000 annual cost: 4,400 salvage value: 4,000 useful life: 5years and MARR= 12%. **(5)**

b) Calculate simple and discounted payback periods from the given cash flow of the projects when the MARR is 20 %. **(5)**

End of Period	Net cash flow
0	-25000
1	+8000
2	+8000
3	+8000
4	+8000
5	+13000

4. a) Determine which combination of the Project is best if the capital to be invested is i) unlimited, ii) limited to Rs 50,000 by using PW method and MARR=10 %. **(5)**

Project	B1	B2	C1	C2	D
Initial investment	50000	30000	14000	15000	10000
Annual revenue	20000	12000	4000	5000	6000
B1 and B2	Mutually exclusive				
C1and C2	Mutually exclusive and contingent on the acceptance of b2				
D	Contingent on the acceptance of C1 and B2				

b) Select the best Project using Present worth (PW) or by using **repeatability Assumption method. (4)**

Project	A	B
Initial investment	400 000	600,000
Annual revenue	30,000	35,000
Annual O&M	3000	4000
Useful life	6	8
Salvage value	4000	7000
MARR	12%	

5. a) 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

b) Perform **the sensitivity analysis** of the following Project over a range of ± 20% in 1) initial investment 2) net annual revenue 3) useful life also. Draw sensitivity diagram. **(4)**

initial investment	5,00,000
Net annual revenue	120,000
Salvage value	80,000
Useful life	6yr
MARR	10%

6. a) A machine costing of 30000 is estimated to have life of 10 years. Find i) Annual Depreciation (dk), ii) Cumulative depreciation throughout 6 years, iii) book value at the end of year 6. If the R=20%, and there is no salvage value by using **Declining balance method. (5)**

b) A machine having a cost of Rs 88000 and estimated salvage value at the end of 6^{th} year is 6000.calculate the depreciation charge per under **Sum of year digit method. (4)**

7. write short notes on; i) principles of economics ii) overhead cost and fixed cost **(2+2)**

The End