Nepal College of Information Technology
Time Bound Open Book Hybrid Examination

Level: Bachelor	Year : 2021
Programme: BE	Full Marks : 100
Course: Engineering Economics	Time : 3 hrs

Candidates are required to give their answer in their words as for as practicable.
The figures in the margin indicate full marks.

Attempt all questions.

1. a) What is engineering economics? Why do you think studying this course is important for engineering students? Justify. 8
   b) Explain manufacturing, non-manufacturing, sunk and opportunity costs with suitable example. 7
2. a) Sagar has taken home loan of Rs. X2 million from a bank, which is to be repaid in equal end of the month installment for 5 years with nominal interest rate of 12 percent compounded monthly. Calculate: (i) the amount of each installment, and (ii) the amount of each installment, if installment is repaid in the beginning of the month installment. (Assume X is the last digit of your PU registration number. For example, if the last digit of your PU registration number is 7 then consider loan as 72 million and if last digit is 0, consider your loan as 02 or 2 million). 8
   b) An investment of Rs. 100,000 can be made in a project that will produce uniform annual revenue of Rs. 62,100 for 5 years and then have a market salvage value of Rs. 20,000. Annul expenses will be Rs. 30,000 each year. Company accepts project that earns 10% or more. Evaluate IRR of this project and suggest whether the project is feasible or not? Also draw an investment balance diagram. 7
3. a) Pokhara University is considering to purchase a new machine costing Rs. 9,00,000 that will have salvage value of Rs. 1,00,000 at the end of 8^{th} year, generates annual income of Rs. 2,30, 000 that needs Rs. 80,000 operating cost for each year. Find both types of BC ratios based on AW formulation. MARR rate is 1X%. (Assume X is the last digit of your PU registration number. For example, if the last digit of your PU registration number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%). 8
   b) From the following information, conduct scenario analysis based on FW formulation. Assume I=2,25,000, MARR=13.5%, and life of project is 5 years. Also give your remarks based on results of different scenarios. 7

Variable Considered	Worst Case Scenario	Most Likely Scenario	Best Case Scenario

Annual Sales	86,000	1,10,000	137,000
Annual Variable Cost	37,000	40,000	38,000
Annual Fixed Cost	21,000	20,000	18,000
Salvage Value	40,000	50,000	60,000

4. a) Compare PW following projects and select best alternatives using repeatability assumption. 8

	A	B
Initial Investment	Rs. 3,50,000	Rs. 4,00,000
Annual Revenue	Rs. 1,80,000	Rs. 2,00,000
Annual Expenses	Rs. 40,000	Rs. 64,000
Salvage Value	Rs. 90,000	Rs. 170,000
Useful Life	2	3
Interest Rate	1X%.	

Assume X is the last digit of your PU registration number. (For example, if the last digit of your PU registration number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%).

b) Define ecological limit and sustainable development. Discuss ways for sustainable development. 4+3

5. a) Compute depreciation charge and book value of each year by using sinking fund method with following information: Salvage Value=Rs. 20,000, Initial cost of Asset=Rs. 100,000, Useful life of asset= 8 years, Interest Rate= 1X%. Assume X is the last digit of your PU registration number. (For example, if the last digit of your PU registration number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%). 8

b) What do you know about equity financing and debt financing? Explain way to project funding mechanisms by giving suitable examples of Nepali context. 4+3

6. a) Describe income statement and balance sheet with their format. How are they related to each other? 7

b) The following is the balance sheet of Gandaki Company Ltd.: 8

Gandaki Company Ltd.

Balance Sheet as of Asar 31, 2077 (Amount in '000)

Assets	**Amount (Rs.)**	**Liabilities and Equity**	**Amount (Rs.)**
Cash	1400	Account payable	4,400
Account	4,000	Notes payable	1400
Receivable	8,000	Other current liabilities	400
Inventory	18,000	Long term debt	6,000
Fixed Assets	17,700	Owners equity	37,200
Total Assets	49,400	Total liabilities and equity	49,400

Additional information:

a. Sales for the year = Rs. 65,000,000.
b. Gross income = Rs. 25,000,000

c. Net income available for shareholder = Rs.16,000,000
d. Inventory (2076) =Rs. 6,000,000
e. Total Assets (2076) = Rs. 42,500
f. Interest Expense = Rs. 700,000
g. Tax rate = 30%

Calculate debt ratio, current ratio, quick ratio, inventory turnover ratio, total asset turnover ratio, return on total assets, gross margin on sales and net margin on sales. Also interpret their results.

7. Write short notes on: (Any Two) 2*5

i) FIRR Versus EIRR
ii) Nominal Rate Versus Effective Rate
iii) Mutually Exclusive Versus Independent Project