POKHARA UNIVERSITY

Level: Bachelor | Semester: Spring | Year: 2020
Programme: BE | Full Marks: 70
Course: Engineering Economics | Pass Marks: 31.5
Time : 2 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt all the questions.

1. In the current COVID pandemic context, you are required to do economic analysis of one engineering project. Takeany one specific example of the engineering project (e.g.: hydropower, mobile app, hospital, canal, etc.) and discuss the steps of engineering economics process (principles) for making investment decision for that project. Also, explain four different cost concepts for engineering decision making and how they can be related in the process of engineering economic evaluation in your above project. 6+4

2. Which interest is used in engineering economic analysis and how do you differentiate between simple, compound, nominal and effective interest rate with suitable example? 4+6

   Binayak has taken home loan of Rs. X5 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, (ii) effective rate of interest of loan, and (iii) 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 Examination Roll Number. (For example, if the last digit of your PU Examination Roll Number is 7, then consider loan as 75 million and if last digit is 0, consider your loan as 05 or 5 million).

3. Compare PW of following projects and select best alternatives using repeatability assumption. MARR rate is 1X.5%. Assume X is the last digit of your PU Examination Roll Number. (For example, if the last digit of your PU Examination Roll Number is 9, then consider interest rate as 19.5% and if last digit is 0, consider your interest rate as 10.5%). 10

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Project	**A**	**B**	**C**
Initial Investment	3000	5500	7000
Annual Revenue	2500	3000	3000
Annual Cost	500	800	1200
Useful Life, Years	2	3	4
Salvage Value	25% of initial investment		

4. "Taxes are voluntary payments to governments without expectations of any benefit to the tax payer." Is this statement correct? Discuss different types of taxes that Nepal government levy. 3+7

   Equipment is purchased for Rs 500000 and having estimated salvage value and useful life Rs 80000 and 10 years, interest rate= 1X%; Assume X is the last digit of your PU Examination

Roll Number (For example, if the last digit of your PU Examination Roll Number is 9, then consider interest rate as 19% and if last digit is 0, consider your interest rate as 10%). Calculate the depreciation amount and book value of each year of the equipment from the following methods.

a. SOYD depreciation method
b. Sinking fund depreciation method.

OR

"It's not an investment if it's destroying the planet. Engineers can contribute in the development of technologically and environmentally-feasible solutions to overcome ecological limits of the planet." Explain the above statements. Discuss different risk analysis methods. Which methods do you think most effective in the context of Covid pandemic situation? Discuss with example.

5. Explain why financial statements are prepared in business organization? Explain types of financial statements and their need for the business organizations. 5+5

Discuss importance of financial ratios in engineering economics. Calculate debt ratio, current ratio and quick ratio of Kathmandu Bakery and interpret their results.

6. The following are proposed projects, their relationships and respective cash flows for the coming budgeting period. Some of the projects are mutually exclusive noted below, and B1 and B2 are independent of C1 and C2. Also, certain projects are dependent of others as mentioned below. 20

Project B1 and B2: Mutually exclusive
Project C1 and C2: Mutually exclusive and dependent on the acceptance of B2
Project D: Contingent on the acceptance of C1

Cash Flows (Rs. 000s) for the end of year

Project	Initial Investment	Annual Revenue	Annual Cost	SV at the end of 3rd year
B1	-55	43	20	20
B2	-32	24	10	12
C1	-16	10	5	4
C2	-15	11	5	5
D	-12	9	4	6

Using the PW and MARR=10%, determine what combination of projects is best if the capital to be invested is a) limited to Rs. 50,000 and b) unlimited.
Assume MARR is 1X.5%. 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%).