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Daffodil International University

Engineering Economics (ECO426)

ID: …… Section: …… CT No.: 3 Date:……..

Time: 25 minutes Obtained Marks: …… Total Marks: 15

Set A

1. Explain the difference between Gross Domestic Product (GDP) and Gross National Product (GNP). [3]

2. The total cost of a CSE household's market basket was Tk 15,000 in the base year (2020) and Tk 17,600 in the current year (2026). [4]

a) Compute the Consumer Price Index (CPI) for 2026.

b) If the CPI in 2025 was 113.50, calculate the exact inflation rate for 2026.

3. Define the Internal Rate of Return (IRR). What are the primary limitations of using the IRR method, particularly regarding mutually exclusive projects of different scales? [3]

4. Compare two alternatives for a 5-year computing need at a MARR of 10%. Option A (Buy servers) has an initial cost of Tk 20,00,000, annual maintenance of Tk 2,00,000, and a salvage value of Tk 5,00,000 at year 5. Option B (Cloud subscription) has an annual cost of Tk 5,50,000 for years 1 to 5 with no initial cost.

Which option is more economical based on your PW analysis? [5]

Formula:

1. **P/F**= $F/(1+i)^n$
2. **P/A**= $A\ [(1+i)^n - 1] / [i(1+i)^n$

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Set-B

1. Why is Bangladesh's GNP historically larger than its GDP? [3]

2. The cost of a market basket is Tk 12,000 in the base year and Tk 15,600 in the current year. The Consumer Price Index (CPI) in the previous year was 120. Compute the Consumer Price Index (CPI) for the current year. Compute the inflation rate. [4]

3. Why is Annual Worth (AW) analysis the preferred method when comparing alternatives with different service lives? [3]

4. The government is evaluating a broadband expansion project. Initial cost: Tk 500 crore (year 0). Annual benefits (increased productivity, e-commerce, education): Tk 120 crore/year for 10 years. Annual operating cost: Tk 20 crore/year. Social discount rate = 8%. [5]

a) Calculate the Benefit–Cost Ratio (B/C) of the project.
b) Based on the B/C ratio, determine whether the project should be accepted or rejected.

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Formula:

P/A: $A\,[(1+i)^n - 1] / [i(1+i)^n$

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Set-C

1. Explain the short-run relationship between inflation and unemployment represented by the Phillips Curve. [3]

2. In an economy, the savings function is given by $S = -100 + 0.2Y$, and autonomous investment is $I = 200$ (Tk crore).

a) Find the equilibrium national income (Y*).

b) If investment rises to 300 due to a tech boom, what is the new equilibrium national income (Y*)? Calculate the value of the investment multiplier. [5]

3. Explain the concept of the Time Value of Money (TVM). What are the primary reasons that explain why money has time value? [3]

4. A project requires an initial investment of Tk 10,000. The annual interest rate is 10%, and the project life is 5 years. [4]

a) Calculate the Future Compound amount (F/P) of the initial investment at the end of 5 years.

b) If the project generates an annual cash inflow of Tk 2,000 for 5 years, calculate the Present Worth (PW) of the annuity at an interest rate of 10% per year.

Formula:

1. **F/P:** $P(1+i)^n$
2. **P/A:** $A\,[(1+i)^n - 1] / [i(1+i)^n$