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Daffodil International University

Faculty of Science & Information Technology
Department of Computer Science & Engineering
Final Examination, Summer 2026
Course Code: ECO426, Course Title: Engineering Economics
Level: 4 Term: 2 Batch: 64

Time: 02:00 Hrs **Marks: 40**

Answer ALL Questions

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1.	*a)*	Differentiate between a cost, an expense, and an investment.	**[3]**	**CO1**
	b)	Analyze the nature of the following expenditure and classify it as revenue or capital expenditure: Tk 30,00,000 spent to acquire a smaller firm's codebase.	**[2]**	
2.	*a)*	A SaaS firm has a fixed cost of Tk 6,00,000 per month and a variable cost of Tk 0.50 per user. If the subscription price is Tk 50 per user per month, estimate the break-even number of paying users.	**[3]**	**CO2**
	b)	Briefly explain the profit-maximizing conditions for a firm.	**[2]**	
3.	*a)*	Compare monopoly and monopolistic competition. Sketch and label the Average Revenue (AR) and Marginal Revenue (MR) curves of a monopoly market.	**[4]**	**CO3**
	b)	An oligopolistic firm faces the following demand functions: • Planned demand (rivals do not respond): $Q = 800 - 50P$ • Actual demand (rivals respond): $Q = 400 - 10P$ Determine: i. The equilibrium price and quantity. ii. The range of marginal cost (MC) over which the price remains unchanged.	**[6]**	
4.	*a)*	Briefly explain an oligopsony and provide a modern tech example.	**[2]**	**CO2**
	b)	Analyze how the concentration of a few major employers (e.g., Google, Microsoft, and Meta) in the AI talent market affects the wages and bargaining power of AI researchers.	**[3]**	
5.	*a)*	The cost of a household's market basket was Tk 15,000 in the base year (2020) and Tk 17,600 in the current year (2026). Determine the Consumer Price Index (CPI) for 2026.	**[3]**	**CO2**
	b)	If the CPI in 2025 was 113.50, estimate the exact inflation rate for 2026.	**[2]**	

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6.	*a)*	A software development company, TechPath Solutions, has a 5-year planning horizon and a MARR of 12% for upgrading its computing infrastructure. Evaluate the following alternatives: • **Option A (In-House System):** Initial investment = Tk 500 lakh; Annual operating cost = Tk 80 lakh; Annual revenue = Tk 350 lakh; Salvage value = Tk 100 lakh. • **Option B (Cloud-Based System):** Initial investment = Tk 0; Annual operating cost = Tk 220 lakh; Annual revenue = Tk 350 lakh; Salvage value = Tk 0. Measure the net cash flows for each year for each alternative.	[4]	CO3
	b)	Estimate the Present Worth (PW) and Annual Worth (AW) of each alternative.	[4]	
	c)	Choose the most economical alternative based on PW and AW analysis.	[2]	

Appendix: Fundamental Engineering Economics Formula

Notation	Equation
$(F/P, i, n)$	$F = P(1+i)^n$
$(F/A, i, n)$	$F = A\dfrac{(1+i)^n - 1}{i}$
$(P/A, i, n)$	$P = A\dfrac{(1+i)^n - 1}{i(1+i)^n}$

N.B. The above formulas are provided for use during the examination. Students are responsible for selecting and deriving the appropriate formula, substituting the given data correctly, performing the required calculations, and interpreting the results.

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