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Daffodil International University
Department of Software Engineering
Faculty of Science & Information Technology
Final Examination, Summer 2025
Course Code: SE213; Course Title: Digital Electronics & Logic Design
Sections & Teachers: 43, A-D (SP), E-G (HI), H & L (NAN), I-K(MTE), M-O (SAN), P (SHN)

Time: 2 Hours **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)	Simplify the following expression and construct the logic circuit diagram of the simplified function — $F = (B + \overline{C})(\overline{B} + C) + \overline{\overline{A} + B + \overline{C}}$	[Marks-5] 5	CLO-2 *Level-3*
	b)	Apply k-map simplification technique to simplify the following expression. $F(A, B, C, D) = \Sigma(5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15)$	[Marks-5] 5	
2.	a)	Apply the concept of an Encoder circuit to build an Octal to Binary converter along with circuit diagram.	[Marks-5] 5	CLO-3 *Level-3*
	b)	Demonstrate the following boolean function using an 8:1 multiplexer. $F(A, B, C, D) = \Sigma(2, 4, 6, 7, 9, 10, 11, 12, 15)$	[Marks-5] 5	
	c)	Configure a 4-to-16 decoder using two 3-to-8 decoders and demonstrate with a diagram.	[Marks-5] 5	
3.	a)	Apply the concepts of latches and flip-flops to identify and explain their differences.	[Marks-4] 3	CLO-4 *Level-3*
	b)	"JK flip-flop is used to remove the drawback of S-R flip-flop" — Validate the statement with appropriate circuit diagrams.	[Marks-5] 5	
	c)	Construct the D flip-flop characteristic and excitation tables, then establish from them that $D = Q_{n+1}$.	[Marks-6] 6	