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Daffodil International University

Department of Software Engineering

Faculty of Science & Information Technology

Midterm Examination, Fall 2024

Course Code: SE 213; Course Title: Digital Electronics & Logic design

Batch: 42 Batches (All); SP, NIR, MBM, SA, SI

Time: 1:30 Hrs **Marks: 25**

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)*	i) **Subtract** the binary numbers using 2's complement method. 100101 – 110011 ii) **Add** the binary addition of the following number: $(111011)_2 + (10111)_2$	[Marks-2+2]	CLO-1 *Level-2*
	b)	**Convert** the following numbers: i) $(9AF3.31A)_{16} = (?)_8$ ii) $(179.1101)_{10} = (?)_2$	[Marks-3]	
	c)	**Discuss** the truth table and logic circuit of the following expression: F= A'B [C (AB + BC) + ABC]	[Marks-3]	
2	*a)*	How can you **demonstrate** that a NAND gate can be used to implement all other basic logic gates, justifying its classification as a universal gate?	[Marks-4]	CLO-2 *Level-3*
	b)	F (A, B, C, D) = $\sum$ (0,4,8,9,10,12,13,14) Apply k-map simplification technique to simplify the above expressions. **Construct** the logic diagrams of the simplified output.	[Marks-5]	
	c)	**Express** a full-adder using by sum of products.	[Marks-6]	