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Daffodil International University

Faculty of Science & Information Technology

Department of Software Engineering

Midterm Examination, Spring_2026

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

Sections & Teachers: 45: NIR (A-D), SP (G-J), NJN (E, F, K, L), RRB (M)

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)*	**Convert** the following numbers: $(9AF3.31A)_{16} = (?)_8$	[Marks-3]	CLO-1 *Level-2*
	b)	A parking management system's central processor internally processes subtraction of two values (10101011 - 11010110) using binary arithmetic with the 1's complement method; the result is then passed to the display unit to show the output. **Subtract** the values to find the output shown on the display unit, showing the necessary steps.	[Marks-4]	
	c)	**Compute** the binary arithmetic operation Division, where Dividend is **1001101** and Divisor is **1010.**	[Marks-3]	
2	*a)*	In a fire Alarm System, the alarm (F) is triggered based on the following Boolean expression $F = \overline{w}y(\overline{\overline{w}xz}) + \overline{w}x\overline{yz} + w(\overline{\overline{x} + y})$ **Illustrate** the simplified expression for the above Fire Alarm System using Boolean Laws and **sketch** the simplified circuit.	[Marks-3+2]	CLO-2 *Level-3*
	b)	**F (A, B, C, D) = ∑ (0,4,8,9,10,12,13,14)** Apply k-map simplification technique to **derive** the most simplified version of the above expressions. **Construct** the logic diagrams of the simplified output.	[Marks-3+2]	
	c)	**Express** the following function into Product of Sum (POS) standard canonical form and then **change** it into its opposite canonical form: **F(X,Y,Z) = (XY + Z') (X'Z + Y)**	[Marks-3 + 2]	