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Daffodil International University

Department of Electrical and Electronic Engineering
Faculty of Engineering
Midterm Examination, Summer-2026

Course Code: 0714-323
Section: A, B, C, D, E
Full Marks: 25

Course Title: Digital Electronics
Level-Term: L3-T1
Exam Date: June 27, 2026

Teacher's Initial: DAS, BS
Time: 1.5 Hours

[Notes: Answer all the questions. The number on the rightmost side of the question indicates the marks]

Q1. (a) **Simplify** the following Boolean function to a **minimum** number of literals using the laws of Boolean algebra. CO1 (C3) 3+8

$F(A, B, C, D) = (A + B + C' + D)(B' + C' + D)(A' + C + D')$

(b) **Design** a combinational circuit that accepts decimal digits represented in 84-2-1 code as input and generates the corresponding 8421 code as output. CO3 (C3)

Q2. (a) **Implement** the following Boolean function using NOR gates only. CO1 (C3) 2+4

$F(A, B, C) = \sum(0, 6)$

(b) Using K-map **find** the simplest form in **SOP** and POS for the following Boolean function: CO1 (C3)

$F(w, x, y, z) = \sum(3, 4, 13, 15)$ with the **don't** care conditions given by $d(w, x, y, z) = \sum(1, 2, 5, 6, 8, 10, 12, 14)$

Q3. (a) **Define** noise margin and propagation delay. **Explain** how the fan out capability of DTL can be increased. CO2 (C2) 5+3

(b) **Draw** neat and properly labeled circuit diagrams of the CMOS NOR and NAND gates. CO2 (C2)

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