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Midterm Examination, Summer-2026

rse Code: 0714-323	Course Title: Digital Electronics	
tion: A, B, C, D, E	Level-Term: L3-T1	Teacher's Initial: I
Marks: 25	Exam Date: June 27, 2026	Time: 1.5 Hours

otes: Answer all the questions. The number on the rightmost side of the question indi

(a) **Simplify** the following Boolean function to a minimum number of literals using the laws of Boolean algebra.

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

(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.

(a) **Implement** the following Boolean function using NOR gates only.

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

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

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

(a) **Define** noise margin and propagation delay. **Explain** how the fan out capability of DTL can be increased.

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