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Computer Engineering Department
National Institute of Technology, Kurukshetra-136119
Mid Term- 1, Even Semester 2022

Paper: ITPC-10 (Digital System Design)
Date: 19.05.2022

Time: 45 Minutes
Maximum Marks: 15

Read Instructions Carefully:

Instructions: *All questions are compulsory, however questions with suitable choices are provided with "OR" option carrying equal marks.*

Q.1. Draw logic gate symbols and truth tables for logical gates OR, AND, NAND, EX-OR and EX-NOR

OR

State and Prove DeMorgan's Law 1 and Demorgan's Law 2. Simplify the following: **5 Marks**

$$\overline{\overline{A + BC} + \overline{AB}}$$

Q.2. Minimize the following boolean function: **5 Marks**

(i) $F(A, B, C, D) = \Sigma m\,(0, 1, 2, 5, 7, 8, 9, 10, 13, 15)$ **2.5 Marks**

(ii) $F(A, B, C, D) = \Sigma m\,(0, 2, 8, 10, 14) + \Sigma d\,(5, 15)$ **2.5 Marks**

Q.3. If the 7-bit Hamming code received by the receiver is 1011011. Assuming the even parity, Check whether the received code is correct or not If found incorrect, locate the bit having the error.

OR

Convert: (a) $3D59_{(16)}$, (b) $27.A3C_{(16)}$ to an equivalent binary number and (c) $(756.603)_8$ to Hexadecimal. **5 Marks** **5 Marks**