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**PRESIDENCY  
UNIVERSITY**

**BENGALURU**

**School of Engineering**

**Mid - Term Examinations - November 2024**

**Semester:** III

**Date:** 06/11/2024

**Course Code:** ECE2002\_v02

**Time:** 11.45am to 01.15pm

**Course Name:** DIGITAL ELECTRONICS

**Max Marks:** 50

**Program:** B.Tech.,(ECE)

**Weightage:** 25%

**Instructions:**

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

**Part A**

**Answer ALL the Questions. Each question carries 2marks.**

**5Qx2M=10M**

- |   |   |         |          |     |
|---|---|---------|----------|-----|
| 1 | The Boolean theorems and Laws are useful in manipulating the logic expression. The equality $A' \cdot B' \cdot C' = (A + B + C)'$ is known as _____ | 2 Marks | Remember | CO1 |
| 2 | $A \cdot B = B \cdot A$ is called as _____  | 2 Marks | Remember | CO1 |
| 3 | A Boolean expression is specified as $A \cdot 0 = 0$ , The dual of given expression is  | 2 Marks | Remember | CO1 |
| 4 | The product terms in the canonical SOP form is called a minterm. The minterm representation for 111 is _____  | 2 Marks | Remember | CO1 |
| 5 | Draw the logic symbol and truth table for <b>NAND</b> universal gate:   | 2 Marks | Remember | CO1 |

**Part B**

**Answer ALL Questions. Each question carries 10 marks.**

**4QX10M=40M**

- |   |  |        |            |     |
|---|--|--------|------------|-----|
| 6 | a. Find the equivalent Decimal value of given Binary $(10111.101)_2$ : | 4Marks | Understand | CO1 |
|   | b. Draw <b>OR</b> gate logic using <b>NOR</b> gate:                    | 2Marks | Remember   | CO1 |
|   | c. Draw <b>ExOR</b> gate using minimum number of <b>NAND</b> gate      | 4Marks | Remember   | CO1 |

**Or**

- 7 a. Find the equivalent Binary value of given Decimal  $(36.125)_2$ : **4Marks Understand C01**
- b. Draw **AND** gate logic using **NAND** gate **2Marks Remember C01**
- c. Draw the **ExOR** gate using minimum number of **NOR** gate **4Marks Remember C01**
- 8 a. Find equivalent Hexadecimal value of  $(377)_8$  : **2Marks Understand C01**
- b. Find A-B using one's complement subtraction, when **A=1011, B=1000**: **4Marks Understand C01**
- c.  **$Y=AB+AC+BC$**  derive the Canonical SoP and Draw the logic diagram using NAND only: **4Marks Understand C02**

**Or**

- 9 a. Find equivalent Octal value of  $(A1B)_{16}$ : **2Marks Understand C01**
- b. Find A-B using Two's complement subtraction, when **A=1011, B=1000**: **4Marks Understand C01**
- c.  **$F=XY+XZ+YZ$**  derive the Canonical SoP and Draw the logic diagram using NAND only: **4Marks Understand C02**
- 10 Implement the given Boolean function using minimum number of NAND gates only: **10Marks Apply C02**  
 **$F(A,B,C,D)=\sum(1,3,4,11,12,13,14,15)$**

**Or**

- 11 Implement the given Boolean function using minimum number of NAND gates only: **10Marks Apply C02**  
 **$F(W X Y Z)=\sum(0,2,3,6,8,9,13,14)$**
- 12 Using K-map method, Simplify the given function (minimum SOP) and realize using basic gates: **10Marks Apply C02**  
 **$F(A,B,C,D) =A'B'C'D' +AC'D' + B'CD' + A'BCD +BC'D$**

**or**

- 13 Using K-map method, Simplify the given function (minimum SOP) and realize using basic gates: **10Marks Apply C02**  
 **$F=\sum m(0,2,3,6,7,13) + d(8,10,11,15)$**