



**Term Evaluation (Odd) Semester Examination September 2025**

Roll no.....

Name of the Course: Diploma  
Semester: Third Semester  
Name of the Paper: Digital Logic  
Paper Code: DTCS 302

**Time: 1.5 hour**

**Maximum Marks: 50**

**Note:**

- (i) Answer all the questions by choosing any one of the sub-questions
- (ii) Each question carries 10 marks.

**Q1. (10 Marks)**

a. Perform the following

- i)  $(475.63)_8 = (?)_{10}$
- ii)  $(2598)_{10} = (?)_{16}$
- iii)  $(11011.101)_2 = (?)_{10}$
- iv)  $(FB7.C9)_{16} = (?)_{10}$

OR

(CO1)

b. State the differences between 1's complement and 2's complement subtraction. Perform the subtraction using 2's complement on the following:  $110100 - 10101$

**Q2. (10 Marks)**

a. Discuss about Analog and Digital systems? Explain the advantage of Digital over Analog systems.

OR

(CO1)

b. Explain the universal logic gates with their truth table. Realize the AND gate using NAND and NOR gates.

**Q3. (10 Marks)**

a. Demonstrate by truth table the validity of the following theorems of Boolean algebra.

- i) Associative Law
- ii) De Morgan's Theorems

OR

(CO2)

b. Simplify the following Boolean expression

- i)  $(A + B)(A + C')(B' + C')$
- ii)  $Y'(X' + Y')(X + X'Y)$
- iii)  $(A+B)' + (A'+B')'$
- iv)  $(A+BC')(AB'+C)$

**Q4. (10 Marks)**

a. What are logic families? Compare any four characteristics of the TTL and CMOS families.

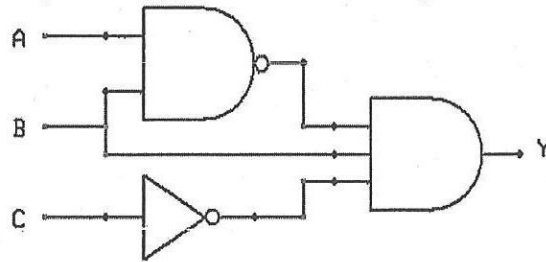
OR

(CO1)

b. Derive the Boolean expression for the following digital circuits and sketch the truth table



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Q5.

(10 Marks)

- a. What are logic gates? Explain the various basic gates with their symbols and truth table.

OR

(CO2)

- b. Deduce the expression for the given truth table and realize the expression using (i) Basic Gates (ii) NAND gates only.

Inputs		Output
A	B	Y
0	0	1
0	1	0
1	0	0
1	1	1