

ROLL No:

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Total number of pages: [2]
Total number of Questions: 06

B.Tech. || ECE || 3rd Semester
Digital Circuit & Logic Design

Subject Code: BTEC-302

Paper ID:

Time Allowed: 3 Hrs

Max Marks: 60

Important Instructions:

- All questions are compulsory
- Assume any missing data

PART A (2×10)

Q. 1. Short-Answer Questions:

All COs

- State De-Morgan's Theorem?
- What do you know about signed and unsigned binary numbers?
- What is difference between PAL and PLA?
- What are the limitations of Asynchronous Counters?
- What is a flip-flop? Why D Flip-flop is so called?
- What is a shift register? Give its types?
- What is need of ADC and DAC?
- What are the advantages of CMOS over DTL?
- What is Fan in and Fan out?
- Compute the result of $(DF)_{16} + (AC)_{16} = (\text{_____})_{16}$?

PART B (8×5)

- Q. 2. i) What are different binary codes? Discuss about BCD codes with some CO1 examples?
- ii) If $X = (1101.1010)_2$ and $Y = (100.1011)_2$; evaluate

$X + Y = \text{_____}$ and $X - Y = \text{_____}$

- OR
- i) Subtract two numbers $(75)_{10} - (15)_{10}$ using 2's complement method of subtraction? CO1
- ii) Convert $(A6F.CD)_{16}$ and $(36.125)_{10}$ into octal numbers? CO1

Q. 3. Minimize the following using K-Map technique and also implement it into a logic circuit: CO2

$$Y(A,B,C,D) = \sum m(1,2,9,10,11,14,15)$$

OR

Explain why NAND and NOR gates are called Universal gates? How would you justify your answer? CO2

Q. 4. What is a Multiplexer? Design a 4:1 Multiplexer using only NAND gates? CO3

OR

What is a Code Converter? Design a binary to Gray Code Converter? CO3

Q. 5. Write a short note on classification of semiconductor memories? CO4

OR

What are different types of counters? Design an asynchronous decade counter using T Flip-flops? CO4

Q. 6. What are different types of Analog to Digital Converters? Explain the operation of Successive Approximation type of ADC in detail? CO4

OR

What are the different Logic families? Explain CMOS and its various types? CO4
