

28-09-2018  
(Evening)

Roll No.: .....

## National Institute of Technology, Delhi

Name of the Examination: B. Tech

Branch : ECE Semester : III  
Title of the Course : Digital Electronics Course Code : ECB 202  
Time: 2 Hours Maximum Marks: 25

Note:

- All Questions are compulsory.

- 
- Q1. Design a 2-bit comparator using two 1-bit comparators and basic logic gates. 3
- Q2. Implement the following function using a Multiplexer with 3 select lines. 3  
 $F(a, b, c, d) = a\bar{b} + acd + d + b\bar{c}$
- Q3. Implement a full subtractor using a 3 to 8 line decoder. 3
- Q4. Find the minimal SOP and POS (both) for the following functions: 3  
 $f(A, B, C, D) = \prod M(2, 4, 6, 8, 12, 14, 15). d(3, 5, 10, 13)$
- Q5. Reduce the following expression using mapping and implement the real minimal expression in universal logic: 3  
 $f(A, B, C, D) = \sum (0, 1, 2, 3, 5, 7, 8, 9, 10, 12, 13)$
- Q6. Design a logic circuit with 4 inputs A, B, C, D that will produce output '1' only whenever two adjacent input variables are 1s. A and D are also to be treated as adjacent. Implement it using NOR gates only. 5
- Q7. Explain the Carry Look Ahead Adder with the help of 4-bit binary addition example. Also write the expression for respective carry out of each full adder. 5

\*\*\*\*\* END OF THE QUESTION PAPER \*\*\*\*\*