National Institute of Technology, Delhi

Name of the Examination: Mid Semester Examination (Autumn Semester 2022)

Branch	**: ECE**	**Semester**	**: 3rd**
Title of the Course	**: Digital Electronics**	**Course Code**	**: ECB 202**

Time: 1.5 Hours **Maximum Marks: 25**

Note: All questions are compulsory.

Section A: Answer all the questions. Each question carries 5 marks. **[5×5=25]**

A1. a) Obtain the reduced POS expression from given minterms **[5]**

$\sum m$ (2,3,6,7,10,11,12,14) using K-Map.

b) Obtain the reduced SOP expression from given minterms

$\sum m$ (0,2,4,5,6,7,8,10,13,15) using K-Map

A2. a) Design and implement Half Subtractor showing all designing steps. **[5]**
Difference (D) = A XOR B Borrow (B) =A'B

b) Design a Full Subtractor using the above-designed Half Subtractor

A3. a) Design a multiplexer for given function f(A,B,C,D) = $\sum m$ (1,2,4,7,8,11,13,14) **[5]** with 3 select lines.

b) Implement a full adder using a 3:8 decoder.

A4. Design a 4-bit Binary to BCD code converter. **[5]**

Section B: Answer any one **[5×1=5]**

B1. Design a 4-bit BCD Adder and explain its working with the help of a suitable example.

B2. Design and explain carry look-ahead adder with the help of a suitable example.

********** All The Best **********