



'समानो मन्त्रः समितिः समानी'

**UNIVERSITY OF NORTH BENGAL**  
BCA Honours 1st Semester Examination, 2023

**CC2-BACHELOR OF COMPUTER APPLICATION (13)**  
**DIGITAL ELECTRONICS**

Time Allotted: 2 Hours

Full Marks: 60

*The figures in the margin indicate full marks.*

**GROUP-A**

**Answer any four questions from the following**

3×4 = 12

1. Convert the hexadecimal number  $(A6B5)_{16}$  into Binary.
2. State the basic Boolean algebra properties.
3. Explain minterms and maxterms.
4. Explain combinational circuit.
5. What is the difference between a half adder and a full adder?
6. Why NAND gates is known as the universal gates? What are its merits?

**GROUP-B**

**Answer any four questions from the following**

6×4 = 24

7. Evaluate the expression  $A + \bar{A}B + \bar{A}\bar{B}C + \bar{A}\bar{B}\bar{C}D$ .
8. What is an adder circuit? How can a full adder be implemented using 2 half adders?
9. Describe a  $8 \times 1$  multiplexer with the help of a block diagram and truth table.
10. Differentiate between half subtractor and full subtractor.
11. Describe a T flip-flop with its block diagram and characteristics equation.
12. Explain decoders with its block diagram.

**GROUP-C**

**Answer any two questions from the following**

12×2 = 24

13. For the logic function  $f = \bar{A}\bar{B}D + \bar{A}BC + \bar{B}\bar{C}\bar{D}$ .
  - (a) Obtain the standard sum of product equation
  - (b) Make a truth table
  - (c) Simplify using K-map
  - (d) Draw the circuit diagram.
14. Explain the different codes for representing data.
15. Explain JK master-slave flip-flop. What is race condition?
16. Derive all the other gates using NOR gates. Draw the diagram and explain the derivation.

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