



'সমানো মন্ত্র: সমিতি: সমানী'

**UNIVERSITY OF NORTH BENGAL**  
BCA Honours 1st Semester Examination, 2022

**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

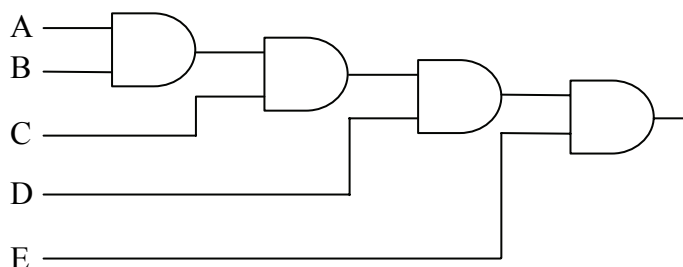
1. What is the difference between hardware and firmware? 3
2. Draw basic block diagram of Computer System. 3
3. State De-Morgan's theorem. 3
4. Draw the logic diagram of full adder. 3
5. What is the function of a multiplexer? 3
6. Discuss 1's complement method by giving examples. 3

**GROUP-B**

**Answer any four questions from the following**

6×4 = 24

7. What is flip flop? Explain D-flip flop. 2+4
8. Discuss different applications of shift registers. 6
9. Discuss multiplexer. 6
10. Discuss the function of asynchronous counter. 6
11. Simplify the given function using K-maps. 6  
$$F(A, B, C, D) = \sum (0, 2, 3, 5, 7, 9, 11, 13, 14)$$
12. Derive the Boolean expression for the logic circuit given below: 6



**GROUP-C**

**Answer any *two* questions from the following**

12×2 = 24

13. Explain cache memory organization with the help of a diagram. 12
14. Explain different Boolean laws and simplify the following Boolean expressions: 6+3+3
- (a)  $\bar{A} B \bar{C} + \bar{A} B \bar{C} D + B \bar{C}$
- (b)  $(\bar{A} + B + \bar{B}A)D$
15. Explain Ripple Counter. Explain BCD Ripple Counter with the help of a logic diagram and timing diagram. 2+10
16. Write short notes on any *two* of the following: 6×2 = 12
- (a) NAND Gate
- (b) Decoder
- (c) Master-Slave flip-flop.

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