Roll. No. : .....

BCA (N)-120

First Semester Examination, 2024 (June)

Digital Electronics

Time : 2 Hours] **[Maximum Marks : 70**

Note : This paper is of seventy (70) marks divided into two (2) Sections 'A' and 'B'. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

SECTION—A

(Long Answer Type Questions)

Note : Section 'A' contains five (5) long answer type questions of Nineteen (19) marks each. Learners are required to answer any two (2) questions only. **2 × 19 = 38**

1. What is the difference between ROM and RAM? Draw the basic structure of RAM cell. Compare static and dynamic RAM cells.

2. Draw and explain working of JK flip flop also explain how it differ with T flip flops.

3. Design a 4:16 decoder using two 3:8 decoders.

4. Reduce the given function using K-map and implement the same using gates :

   F (w, x, y, z) = Σ (0, 13, 7, 11, 15)

   D (w, x, y, z) = (2, 4)

5. How will you convert R-S flip flop into J-K flip flop? Also discuss characteristic table of J-K Flip flop.

SECTION—B

(Short Answer Type Questions)

Note : Section 'B' contains eight (8) short answer type questions of Eight (8) marks each. Learners are required to answer any four (4) questions only. **4 × 8 = 32**

1. Why the NAND and NOR gates are commonly used in place of the AND and the OR gate?

2. What is a register? How it differs from a counter?

3. Illustrate the frequency division capability of the T flip-flop.

4. Simplify the following Boolean function using Karnaugh maps :

   F(W, X, Y, Z) = Σ(2, 3, 12, 13, 14, 15)

5. Explain the working of full adder with the help of truth table and logic diagram.
6. What is a latch? Discuss the working of SR latch with NAND Gate.
7. What do you understand by digital system? What are the benefits of digital system over analogue system?
8. Design a D flip flop and explain its working.

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