A–830

Total Pages : 3 **Roll No. .....**

MCS-404/DCA-104

(MSCIT/DCA)

(Digital Electronics)

1st Semester Examination, 2024 (June)

Time : 2:00 Hrs. Max. Marks : 70

Note* :–** This paper is of Seventy (70) marks divided into Two (02) 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) 2×19=38

***Note* :–** Section 'A' contains Five (05) Long-answer type questions of Nineteen (19) marks each. Learners are required to answer any *two* (02) questions only.

1. (a) Use 2's complement to perform $(1111 - 1101)_2$

   (b) Carry out subtraction using: 1's complement for $(101101 - 11001)_2$

   (c) Subtract 55 from 24 using 10's complement method

2. Define maxterm and minterm with example. Simplify the given Boolean function using :

   K-Map-F(A, B, C, D, E) = Σ(0, 1, 2, 3, 8, 12, 15, 16, 17, 18, 19, 22, 28, 31)

3. Define combinational logic. Explain the design procedure for combinational circuits. Design a combinational circuit for parity generation.

4. What do you mean by flip flops. Explain different type of flip flops along with their excitation and characteristics table.

5. What is memory ? Draw the block diagram of a typical (2048 × 16) bits ROM and describes its working principles.

Section–B

(Short Answer Type Questions) 4×8=32

***Note* :–** Section 'B' contains Eight (08) Short-answer type questions of Eight (08) marks each. Learners are required to answer any *four* (04) questions only.

1. Prove that Gray code is both a reflective and unit distance code ?
2. Explain Universal gate. Using NAND and NOR gate realize all the basic logic gate.
3. What is a multiplexer ? With diagram explain the working of a 8-to-l multiplexer.
4. What are sequential circuits ? Distinguish between combinational circuit and sequential circuit.
5. What is race-around condition of a J-K flip-flop ? How can it be avoided ?
6. Define shift registers. What are the different types of shift type ?
7. What are the differences between asynchronous and synchronous counter ?
8. What is secondary memory ? List the advantages and limitations of magnetic disk and magnetic tapes as a secondary storage device.

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