

S-710

Total Pages : 4

Roll No. -----

MSCIT-02

Digital Logic

(MCA/PGDCA/MSICIT)

1st Semester, Examination 2022(Dec.)

Time: 2 Hours

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.

Section – A

(Long Answer – type questions)

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.

[2 x 19 = 38]

P.T.O.

Q.1. What is Karnaugh map? How its help in simplifying a given Boolean expression? Simplify the following expression using K map and implement and the output using fundamental gates.

$$X = ABCD + \overline{A}\overline{B}\overline{C}\overline{D} + \overline{A}B\overline{C}D + A\overline{B}C\overline{D}$$

Q.2. Define combinational logic. Explain the design procedure for combinational circuits. Design a combinational circuit for BCD to Gray code converter.

Q.3. What is excitation and state table. Write the excitation table for JK FF and T FF. Realize SR-flip flop, JK-flip flop using D type flip flop?

Q.4. What is meant by counter. Differentiate between synchronous and asynchronous counters. What is lock-out condition of a counter? Design a 3-bit synchronous UP/DOWN counter.

Q.5. Explain the following terms:

- a) Dynamic memory
- b) Volatile storage
- c) Grey Code
- d) Maskable programmable.

Section – B

(Short-answer-type questions)

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.

$$[4 \times 8 = 32]$$

- Q.1. Write and explain the postulates of Boolean algebra.
- Q.2. Use 2's complement to perform
- a) $(1111-1101)_2$
 - b) $(10111-10011)_2$
- Q.3. What are the universal gates? Name the universal gates. Realize XOR gate with the help of universal gates.
- Q.4. What is the difference between combinational and sequential circuits? Give a few example of each of them.
- Q.5. What is a decoder? Explain 3 to 8 decoder with logic diagram.

P.T.O.

- Q.6. What is race around condition? In which flip flop it is overcome?
- Q.7. Define shift registers. What are the different types of shift type?
- Q.8. What do you mean by multiplexer? Explain the working of a 8- to -1- multiplexer with diagram.
