S-767

Total Pages : 4   Roll No. --------------

MCS-404/DCA-104

Digital Electronics

(MSCIT/PGDCA/DCA)

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. Explain Self-complementing codes, refractive code and unit distance codes? Prove that Gray code is both a reflective and unit distance code? Determine the Gray code for (a) 3710 and (b) 9710.

Q.2. Simplify the Boolean function F (A,B,C,D) = $\sum$(1, 5, 8, 9, 10) in (a) sum of product and (b) product of sums.

Q.3. What is universal shift register? Explain the operation of universal shift register with neat block diagram.

Q.4. What do you mean by counter? What are the different types of counters? What are the differences between asynchronous and synchronous counter? Draw the logic diagram and timing diagram for three stage synchronous counter.

Q.5. What is memory? Explain ROM family. How it is classified? Draw a block diagram of a memory which has 4 word 3 bit per word memory and explain it.

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 x 8 = 32]

Q.1. State and prove the Demorgan's Theorem for two variables.

Q.2. Construct a full-subtractor using:
   (i)   basic gates
   (ii)   NAND gates

Q.3. What is sequential circuit? How it differ from combinational circuit?

Q.4. Write the excitation table for JK FF and T FF. Convert a D FF into JK FF.

Q.5. Explain the principal of an encoder. Draw a decimal to BCD encoder.

P.T.O.

Q.6. What is edge-triggered and master-slave flip-flop?

Q.7. Explain the process of generating prime implicants through an example.

Q.8. Convert the following to its decimal equivalent:
   a) $(81B6.F)_{16}$
   b) $(765.45)_8$

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