[Total No. of Questions - 9] [Total No. of Printed Pages - 3]
(2063)

976

MCA 1st Semester Examination

Digital Organization

MCA-102

Time : 3 Hours **Max. Marks : 60**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt FIVE questions in all, select ONE question from each UNIT, and Questions no. 9 is compulsory. All question carry equal marks.

UNIT - I

1. Do the following conversion.

   (a) $(5563800)_{10}$, $(.....)_{8}$, $(.....)_{16}$

   (b) $(5D5F7E))_{16}$, $(.....)_{2}$, $(.....)_{8}$

   (c) $(1110100111.111011)_{2}$, $(.....)_{10}$, $(.....)_{8}$

   (d) $74455827)_{8}$, $(.....)_{2}$, $(.....)_{10}$ **(12)**

2. Write short on the following:

   (i) BCD arithmetic

   (ii) Hamming code

   (ii) Number system

   (iv) Floating point operations **(12)**

UNIT - II

3. Explain the following:

   (a) Draw and explain the characteristic of CMOS and TTL.

   (b) Bipolar junction transistor. **(12)**

4. Explain the following:

   (a) What arc the characteristics of digital ICs used to compute their performance?

   (b) Forward and reverse bias diode. **(12)**

UNIT - III

5. Minimize the logic function:

   (FA, B, C, D) = πM (l, 2, 3, 8, 9, 10, 11, 14) × d (7, 15)

   Use Karnaugh map. Draw the logic circuit for the simplified function using NOR gates only. **(12)**

6. With relevant logic diagram and truth table explain the working of a two input EX-OR. State and prove Demorgan's laws. **(12)**

UNIT - IV

7. With the help of a neat diagram, explain the working of a weighted-resistor D/A converter. **(12)**

8. Distinguish between combinational logic circuits and sequential logic circuits. How are the design requirements of combinational circuits specified? **(12)**

COMPULSORY QUESTIONS

9. Explain the following:

   (a) What is signed binary numbers?

   (b) How can using don't-care aid circuit simplification?

   (c) Show how to connect NAND gates to get an AND gate

   (d) What are the physical significance of storage time and transition time in diode switching

   (e) What is a half-adder? Explain a half-adder with the help of truth-table and logic diagram? **(12)**