Exam. Code : 107202
Subject Code : 2044

BCA Semester—II

PRINCIPLES OF DIGITAL ELECTRONICS

Paper–II

Time Allowed—3 Hours]   [Maximum Marks—75

Note : Attempt any FIVE questions.

1. (a) Show that NAND gates are universal gates.   7.5

   (b) Using 2's complement notation perform the following arithmetic operations using 8 bit register(s) :

      (i) $25 + (-12)$ (ii) $17 - 6$

     (iii) $-18 - 16$ (iv) $18 + (18)$

      (v) $12 - (-19)$ 7.5

2. (a) Discuss in brief De Morgan's theorems with example.

   (b) Write a short note on don't care conditions.

   (c) Simplify the expression :

         $AB + A(B + C) + B (B + C)$.   5×3

3. (a) Explain SOP form and POS form of logic expression.

   (b) What is meant by the base of a number system ? Give examples to illustrate the role of base in positional number system.

   (c) Distinguish between combinational and sequential circuits.   5×3

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4. Write the truth table of a Full Adder and then from it derive the circuit in terms of half adders. 15

5. Draw the circuit of an S-R Flip Flop using NAND gates only. From it derive the circuit of a D-Flip Flop and explain its truth table. 10

   Draw the circuit of a 2 to 4 decoder and explain its function. 5

6. (a) What are counters ? Explain the working of a typical counter in detail. 10

   (b) Distinguish between static and dynamic devices.
   5

7. (a) Explain the working of a RAM cell. 10

   (b) Explain the read and write memory operations in detail. 5

8. (a) Explain various types of memory and their characteristics. 10

   (b) Explain the address selection logic in PROMS.
   5

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