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BIEE-017

01335

B.TECH. - IN-ELECTRICAL ENGINEERING

Term-End Examination

June, 2012

BIEE-017 : DIGITAL ELECTRONICS

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt **any seven** question from **1** to **10**.*

1. Express the Boolean function $F = xy + x'z$ in a product of maxterm form. **10**

2. Express the Boolean function $F = A + B'C$ in a sum of minterms. **10**

3. Given the Boolean function : **10**

   $F = xy + x'y' + y'z$

   (a) Implement it with only OR and NOT gates.

   (b) Implement it with only AND and NOT gates.

4. Simplify the function $F = \Sigma(0, 1, 2, 8, 10, 11, 14, 15)$ by using the tabulation method. **10**

5. (a) Design a combinational circuit with four input lines that represent a decimal digit in BCD and four output lines that generate the 9's complement of the input digit. 8

(b) Obtain the NAND logic diagram of a full-adder from the Boolean function : 2

$C = xy + xz + yz$

$S = c' (x + y + z) + xyz$

6. (a) A combinational circuit is defined by the functions $F_1 (A, B, C) = \Sigma(3, 5, 6, 7)$ 7

$F_2 (A, B, C) = \Sigma(0, 2, 4, 7)$

Implement the ckt. with a PLA having three inputs, four product terms and two inputs.

(b) Implement the function 3

$F (A, B, C, D) = \Sigma (0, 1, 3, 4, 8, 9, 15)$

with a multiplexer.

7. Design the binary counters having the following repeated binary sequence. Use JK flip flops. 10

(a) 0, 1, 2

(b) 0, 1, 2, 3, 4

(c) 0, 1, 2, 3, 4, 5, 6

8. (a) Design a synchronous BCD Counter with JK flip - flops. 7

(b) Draw the diagram of a 4-bit binary ripple counter using flip-flops that trigger on the positive edge. 3

9. (a) What is the difference between the microprocessors 8086 and 8088 ? 8

(b) Why is the data bus in most microprocessors bidirectional while the address bus is unidirectional ? 2

10. (a) A subroutine return address can be stored in an index register instead of a stack. Discuss the advantages and disadvantages of this configuration. 3

(b) Describe the instruction cycle of Intel 8085 microprocessor. 7