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[5252]-562

S.E. (Computer Engineering) (First Semester)

EXAMINATION, 2017

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2015 PATTERN)

Time : Two Hours

Maximum Marks : 50

N.B. :- (i) Attempt Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6,
Q. 7 or Q. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Assume suitable data, if necessary.

1. (a) Design and implement Binary to Gray code converter using logic gate. [6]
- (b) Explain look ahead carry generator in detail. [4]
- (c) Draw basic internal structure of Decade counter IC 7490 and explain its operation. [2]

Or

2. (a) Implement full adder using 8:1 Multiplexer and draw the diagram. [6]
- (b) Write a short note on Johnson counter. [4]
- (c) Convert the following flip-flop : [2]
D-Flip-Flop to T-Flip-Flop

P.T.O.

3. (a) Design the ASM chart for a 2-bit binary counter having one enable line E such that when : [6]
E = 1 (count enabled) and
E = 0 (counting is disabled).

- (b) A combinational Circuit is defined by the following function : [6]

$$F1(A,B,C) = \Sigma m (0,1,3,7)$$

$$F2(A,B,C) = \Sigma m (1,2,5,6)$$

Implement this circuit with PLA.

Or

4. (a) Write VHDL code for full adder using structural style of Modeling (Declare half adder as a component) and also draw truth table and diagram of full adder. [6]

- (b) Explain entity declaration for XOR gate [2]

- (c) A combinational circuit is defined by the function : [4]

$$F1 = \Sigma m(0,1,3,4)$$

Implement this circuit with PAL.

Or

5. (a) Draw and explain the circuit diagram of CMOS Inverter. [5]

- (b) Define the following terms and mention the standard values for TTL logic Family : [8]

1. Noise Margin
2. Fan Out
3. Power Dissipation
4. Propagation Delay.

Or

6. (a) Draw and explain 2-input NAND TTL logic gate with totem pole output driver. [7]

- (b) 1. Give the classification of logic family [6]
2. Explain the advantage of open collector output.
7. (a) Explain the features of 8051 Microcontroller [4]
(b) What are the different addressing Modes in 8051 ? Give example of each. [6]
(c) Explain the following pins of 8051 : [3]
1. ALE
2. XTAL
3. \overline{EA} .

Or

8. (a) Describe different timer modes of 8051 Microcontroller. Draw format of TMOD register. [7]
(b) Explain the following instructions with respective to 8051 and give example of each : [6]
1. PUSH
2. MUL
3. CPL.