Total No. of Questions—8] [Total No. of Printed Pages—3

Seat No.	

[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) = Σm (0,1,3,7)

F2(A,B,C) = Σm (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 = Σm(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.