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<b>Seat No.</b>	
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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.