

**B.Tech. – VIEP – COMPUTER SCIENCE AND  
ENGINEERING (BTCSVI)**

**Term-End Examination**

**December, 2015**

**BICS-009 : LOGIC DESIGN**

*Time : 3 hours*

*Maximum Marks : 70*

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**Note :** *Attempt any seven questions. All questions carry equal marks.*

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1. Simplify the Boolean function :

$$F(w, x, y, z) = \sum (1, 3, 7, 11, 15)$$

which has the don't care conditions :

$$d(w, x, y, z) = \sum (0, 2, 5). \quad 10$$

2. (a) Design a circuit to realize the following function :

$$F(a, b, c) = AB + A\bar{C} + \bar{B}\bar{A}C. \quad 5$$

- (b) Implement the following Boolean function using 8 : 1 MUX :

$$F(A, B, C, D) = \sum (1, 3, 4, 11, 12, 13, 14, 15). \quad 5$$

3. (a) Write a short note on PAL and PLA. 5
- (b) Explain the concept of parity generator and checker and their applications. 5

4. (a) Represent  $(-17)_{10}$  in sign magnitude, one's complement and two's complement representation. 5
- (b) Explain the operation of ALU. 5
5. (a) Explain Schmitt trigger with its characteristics. 5
- (b) What do you mean by universal register ? List the applications of shift register. 5
6. (a) Explain Master-Slave concept and discuss the complete functioning of MS-JK flip-flop. 5
- (b) Design a 3-bit binary UP/Down counter with a direction control M using JK flip-flops. 5
7. (a) List and explain the specifications of D/A converters. 5
- (b) Discuss the accuracy and resolution for A/D and D/A converters. 5
8. Implement 3-bit odd parity generator using JK flip-flops with the help of a state diagram, state table, transition table and excitation table. 10
9. (a) Explain the concept of CMOS and also explain CMOS operating and performance characteristics. 5
- (b) What are the merits and demerits of TTL ? Mention the name of TTL sub-families. 5

**10. Write short notes on any *two* of the following :** ***2×5=10***

- (a) Fast Adder
  - (b) Synchronous vs Asynchronous Counter
  - (c) Open Collector Gates
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