

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

**Term-End Examination**

00366

**December, 2014**

**BICS-009 : LOGIC DESIGN**

*Time : 3 hours*

*Maximum Marks : 70*

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**Note : Seven questions are required to be answered.**

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1. (a) Explain 1's complement and 2's complement in the binary number system. 2+2=4
- (b) Perform subtraction using : 3+3=6
- (i) 1's complement method
- (ii) 2's complement method
- $(11010)_2 - (10000)_2$
- $(1000100)_2 - (1010100)_2$
2. What is the function of a shift register ? What are its various types ? Explain serial in-serial out shift register. 2+4+4=10
3. What is the function of a flip-flop ? How can a R-S flip-flop be constructed, using NAND gates ? Explain its working with truth table. 2+4+4=10

4. (a) What is a sequential circuit ? Write some examples of sequential circuits.  $2+2=4$
- (b) What is a half-adder ? How can a full-adder be realized from two half-adders ?  $2+4=6$
5. (a) Explain minterm canonical form or standard sum of products and maxterm canonical form or standard product of sums.  $2+2=4$
- (b) Simplify the function  $Y = \overline{A} \overline{B} \overline{C} + A \overline{B} \overline{C}$  by Karnaugh map method.  $6$
6. What is a full-adder ? Write truth table for a full-adder and develop its logic circuit.  $2+4+4=10$
7. What is counters ? Draw the schematic diagram of an asynchronous (ripple) counter. Why is it called ripple counter ? Give some examples of asynchronous counter ICs.  $2+4+2+2=10$
8. Discuss the function of encoders, decoders and code converters with proper diagrams.  $10$
9. What is analog to digital conversion ? Explain A/D converter – counter method.  $2+8=10$
10. Write short notes on any *two* of the following :  $5+5=10$
- (a) 7400 TTL
- (b) 74C00 CMOS
- (c) TTL-to-CMOS Interface
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