

Seat No.: \_\_\_\_\_

Enrolment No. \_\_\_\_\_

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**MCA - SEMESTER-1 • EXAMINATION – WINTER 2013**

**Subject Code: 610004**

**Date: 24/12/2013**

**Subject Name: Fundamentals of Computer Organization**

**Time: 02:30 pm TO 05:00 pm**

**Total Marks: 70**

**Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Answer the following. **03**
- 1) Convert the  $(1234)_{10}$  number to binary, octal and hexadecimal number system. **03**
  - 2) Perform the subtractions of the following binary numbers using 1's and 2's complements with proper steps. **04**  
 $(1101)_2 - (1010)_2$
- (b)** Answer the following. **03**
- 1) What is Binary-Coded-Decimal Number System (BCD)? Convert  $(1234)_{10}$  to the BCD. **04**
  - 2) What is EX-OR gate? Draw the block diagram, and truth table for 3-variable EX-OR gate.
- Q.2 (a)** A digital circuit has 4-variable (A,B,C,D). This circuit has output 1 only for (0000),(0010),(0101), (1011) and (1111) inputs. Draw the K-Map and simplify the Boolean expression. **07**
- (b)** Which are the basic components of a digital computer? Draw the diagram and explain the purpose of each component in details. **07**
- OR**
- (b)** Which gates are known as universal gate? Why? **07**
- Q.3 (a)** What is flip-flop? Explain RS Flip flop in details. **07**
- (b)** What is the shift register? With the help of block diagram and wave from, explain working of the shift register. **07**
- OR**
- Q.3 (a)** What is master-slave flip flop? Explain in details. **07**
- (b)** What is binary counter? With the help of block diagram and wave from, explain working of the binary counter. **07**
- Q.4 (a)** What is adder? How the half adder is used to construct the full adder? Explain in details. **07**
- (b)** Why do we require various instruction formats ? Explain Two-Address Instruction and Zero –Address Instruction in details. **07**
- OR**
- Q.4 (a)** What is the multiplexer? Draw 8 to 1 line multiplexer and explain its working. **07**
- (b)** List the various addressing mode and explain direct and index addressing mode in details. **07**
- Q.5 (a)** What is RAM and ROM ? Explain working of RAM with block diagram. List the types of ROM. **07**
- (b)** Explain auxiliary memory in details. **07**
- OR**
- Q.5 (a)** What is Direct Memory Access (DMA)? Explain working of DMA with diagram. **07**
- (b)** Explain various types of the printer in details. **07**

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