

**GUJARAT TECHNOLOGICAL UNIVERSITY****MCA- I<sup>st</sup> SEMESTER–EXAMINATION – MAY/JUNE - 2012****Subject code: 2610004****Date: 01/06/2012****Subject Name: Fundamentals of Computer Organization (FCO)****Time: 02:30 pm – 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) 1. Write the first 12 numbers in the base 4 number system. **02**  
 2. What are the types of complements? Write rules for complement. **02**  
 3. Multiply  $1010.101_2$  by  $110.01_2$  **02**  
 4. Subtract  $16.47_8$  from  $20.14_8$  **01**
- (b) 1. List De Morgan's theorems. Explain any one. **02**  
 2. Which are the universal gates? Describe any one. **02**  
 3. Describe different methods to represent negative binary numbers. **02**  
 4. Write dual of  $AB + \overline{A}(B + \overline{C})(D + \overline{B})$  **01**
- Q.2** (a) Write short note on basic components of a digital computer. **07**  
 (b) Explain X-OR Gate with truth table, circuit, and Boolean expression for two and three input variables. **07**
- OR**
- (b) Write a short note on different categories of Printers. **07**
- Q.3** (a) What is a Counter? Write a note on asynchronous Binary counter with necessary figures. **07**  
 (b)  $F(X, Y, Z, W) = \sum m(4, 6, 7, 8) + D(2, 5, 11, 12)$  using K-map **07**  
 1. Find SOP expression  
 2. Implement this simplified expression using two level AND-to-OR gate network.  
 3. Implement this expression using NAND gates only.
- OR**
- Q.3** (a) What is a flip-flop? Write characteristics of flip-flop. Explain RS flip-flop with waveform. **07**  
 (b) Explain basic working and application of Multiplexer in detail. **07**
- Q.4** (a) Write short note on magnetic disk memories. **07**  
 (b) Describe different types of buses. Explain interface of buses with processor, memory and I/O devices. **07**
- OR**
- Q.4** (a) Write short note on random-access memories. **07**  
 (b) What do you mean by Addressing Techniques? Explain Indirect and Indexed Addressing techniques with an example. **07**
- Q.5** (a) Explain various parts of EU in 8086. **07**  
 (b) Describe two-address and zero-address instruction word formats. **07**
- OR**
- Q.5** (a) Draw the block diagram of 8086 and explain queue and segment registers. **07**  
 (b) Explain different addressing modes of 8086 with example. **07**

\*\*\*\*\*