Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA- Ist 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)= ∑m (4, 6, 7, 8) + D (2, 5, 11, 12) using K-map 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.	**07**
		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**

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