Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER–I • EXAMINATION – SUMMER 2013

Subject Code: 2610004 **Date: 13-06-2013**

Subject Name: Fundamentals of Computer Organization

Time: 10:30am to 13:00pm **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)**	i)	Define the following terms: register, multiplexer, latch	**03**
		ii)	Convert $(0.6875)_{10}$ to binary.	**02**
		iii)	Convert $(1010.011)_2$ to decimal.	**02**
	(b)	i)	What is a BCD code? What are its advantages and disadvantages?	**03**
		ii)	Where does complements are used? Compare 1's complement with 2's complement.	**04**
Q.2	**(a)**	i)	State the De Morgan's theorems. Explain any one.	**03**
		ii)	Simplify the following Boolean function: i) xy+x'z+yz ii) x'y'z+x'yz+xy'	**04**
	(b)		Draw and explain the block diagram of a digital computer.	**07**
			OR	
	(b)		Briefly explain the working of any three peripheral devices.	**07**
Q.3	**(a)**	i)	Draw the truth table and graphical symbol, and write the algebraic function for following gates: AND, XOR	**03**
		ii)	Simplify the Boolean function: F= A'B'C'+B'CD'+A'BCD'+AB'C'	**04**
	(b)		What is Flip-flop? Draw and explain the logic diagram and characteristics table of RS flip flop.	**07**
			OR	
Q.3	**(a)**	i)	Implement the Boolean function F = xy+x'y'+y'z using logic gates.	**03**
		ii)	Simplify the following Boolean function: F(w,x,y,z) = ∑(0,1,2,4,5,6,8,9,12,13,14)	**04**
	(b)		What is counter? Design and explain 3-bit binary counter.	**07**
Q.4	**(a)**	i)	Implement full adder in sum of products.	**03**
		ii)	Define following terms: instruction word, instruction cycle, instruction counter, op-code register	**04**
	(b)		What do you mean by Addressing Techniques? Explain the direct, relative and indexed addressing techniques with an example.	**07**
			OR	
Q.4	**(a)**	i)	Define access time; seek time and latency for disk memories.	**03**
		ii)	Differentiate Static and dynamic RAM	**04**
	(b)		Explain the organization of control registers of control unit.	**07**
Q.5	**(a)**		Explain the interface of different buses with processor, memory and	**07**

		I/O devices.	
	(b)	Draw and explain the block diagram of 8086 and explain it.	**07**
		OR	
Q.5	**(a)**	Briefly explain the instruction format of 8086 and explain the working of following instructions: Working of MOV, ADD, MUL,CMP, DEC, XOR	**07**
	(b)	Draw the structure of 8086 execution unit and explain it.	**07**