

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA SEM-I Examination- Jan.-2012

Subject code: 2610004**Date: 05/01/2012****Subject Name: Fundamentals of Computer Organization (FCO)****Time: 10.30 am-1.00 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)** Do as directed :
- i. Perform: $1001.1_2 + 1011.01_2$ **01**
 - ii. Perform: $1101.1_2 - 1010.01_2$ **01**
 (Without any Complement method)
 - iii. Convert $(512.5)_{10}$ to its equivalent binary number. **01**
 - iv. Obtain 2's complement of 0.0111. **01**
 - v. Convert $(1001111.0111111)_2$ to its equivalent hex number. **01**
 - vi. Convert $(1111.1101)_2$ to its equivalent octal number. **01**
 - vii. Convert $(A8.B7)_{16}$ to its equivalent octal number. **01**
- (b)** Do as directed :
- i. Logical '+' and '.' obey a mathematical rule called _____ **01**
 - ii. Give the truth table for two input AND gate. **01**
 - iii. $(1')' =$ _____. **01**
 - iv. $X' + XY' =$ _____. **01**
 - v. $X(X + Y) =$ _____. **01**
 - vi. Dual of $A' + BC =$ _____. **01**
 - vii. If all minterms are placed in K-map of any type then it gives _____ simplified expression. **01**
- Q.2 (a)**
- i. Write a note on VDU. **06**
 - ii. CPU mainly comprises of _____, _____ & _____. **01**
- (b)**
- i. For the SR flip flop sequence of output and its complement are $X=110010$ & $X' = 001001$. Draw the square wave forms for S, R inputs and X, X' outputs. **05**
 - ii. Perform Subtraction using 1's and 2's complement method : $0.11001 - 0.00100$. **02**
- OR**
- (b)**
- i. Explain 3-bit asynchronous binary counter. **05**
 - ii. Write the Excess-3 codes for decimal numbers. **02**
- Q.3 (a)**
- i. Explain Full adder circuit. **06**
 - ii. Natural complement of Excess-3 code gives _____ complement for its decimal equivalent. **01**
- (b)**
- i. Write a note on Primary Memory. **06**
 - ii. Write basic symbols of duodecimal number system. **01**
 (Use alphabets if required.)

OR

Q.3	(a)	i. Explain Multiplexer.	06
		ii. Write basic symbols of quinary number system.	01
	(b)	i. Write a note on magnetic disk memories.	06
		ii. _____ are the weights of BCD numbers.	01
Q.4	(a)	i. Draw Timing signals for synchronous transfer.	03
		ii. Explain Instruction and Execution cycle.	04
	(b)	Write a Boolean Expression (SOP) for a logic circuit that will have a 1 output when $X=0, Y=0, Z=1$ and $X=1, Y=1, Z=0$; a 0 output for all other input states. Draw a logical diagram.	07
		OR	
Q.4	(a)	i. Draw Timing signal for asynchronous transfer.	03
		ii. List the basic control registers of digital computer with their purpose.	04
	(b)	Write a Boolean Expression (POS) for a logic circuit that will have a 0 output when $X=Y=Z=0$; $X=1, Y=Z=0$; $X=Y=Z=1$; a 1 output for all other input states. Draw a logical diagram.	07
Q.5	(a)	Give the details of Instruction word formats.	07
	(b)	Draw and discuss the structure of Execution unit.	07
		OR	
Q.5	(a)	List all addressing techniques. Explain any 2 with suitable example.	07
	(b)	Explain working of MUL & XOR instructions.	07
