Candidate No:_____

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MCA – Semester I (ATKT)

MC 02 – Fundamentals of Computer Organization

Date: 09-04-2013 **Time: 10.00am – 1.00pm** **Total Marks: 50**

Instructions

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

Q1. Answer the following **[10]**

a) Convert the binary number 111011.1011 to its equivalent decimal representation.

b) Convert the decimal number 632.97 to its equivalent octal representation.

c) Perform binary multiplication on 10111.1 * 1011.11

d) Perform 2's complement on -42-20

e) Perform 10's complement on 24 -68

Q2(a). Fill up the following. **[10]**

1) Excess-3 code is also known as _____.

2) _____ is a means to describe how the output of a logic circuit depends on the logic level present at the input.

3) A logic circuit that adds three 1-bit number is called as _____.

4) A group of _____ stores more than 1 bit of digital data.

5) The data stored in memory in terms of groups of binary bits are called as _____.

Q2(b). 1) What is 2-4-2-1 code?

2) Minimize the following expression using K-Map

$$Y(A,B,C,D) = \sum m(0,2,4,7,8,10,12,13)$$

(Or)

1) State DeMorgan's Theorems

2) Minimize the following expression using K-Map

$$Y(A,B,C,D) = \prod M(1,2,3,8,9,10,11,14) \cdot d(7,15)$$

Q3. Answer the following **[10]**

a) List out the steps to design a combinational logic circuit using gates and design a 1 bit comparator using logic gates.

b) Explain in detail about Full Adder.

(Or)

P.T.O

a) Write the algorithm of 9's complement BCD subtraction and explain it with an example.

b) What are the applications of multiplexer? Implement the following expressions using a multiplexer. $Y(A,B,C) = \prod M(0,1,4,5)$

Q4. Answer the following **[10]**

a) What is the limitation of S-R flip flop? How is it rectified in J-K flip flop? Explain them.

b) State any 5 characteristics of flip-flops.

(Or)

a) Explain the excitation table of RS and JK flip flops.

b) Explain in detail about asynchronous loading of PISO shift register.

Q5. Answer the following **[10]**

a) Draw the functional diagram of the memory and explain its components.

b) Briefly explain about any 5 characteristics of memory.

(Or)

a) What are interrupts? Explain its types.

b) Explain Instruction Cycle.