KUMARAGURU
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MCA DEGREE EXAMINATIONS: DEC 2014

(Regulation 2013)

First Semester

MASTER OF COMPUTER APPLICATIONS

P13CAT101 : Computer System Architecture

Time: Three Hours   **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

1. Convert the following decimal numbers to binary :

    (i) 12.0625   (ii) 673.23

2. Simplify the following Boolean functions using three variable K Maps:

    (i) $F(x,y,z) = \sum(0,1,5,7)$ (ii) $F(A,B,C) = \sum(0,2,3,4,6)$

3. Draw the truth table and logic diagram of half adder.

4. Distinguish decoder and encoder.

5. What is a binary incrementer?

6. Mention the phases in instruction cycle.

7. Name the commands that an interface may receive.

8. Specify the way to establish CPU-IOP communication.

9. How many 128 X 8 RAM chips are needed to provide a memory capacity of 2048 bytes?

10. Mention the fields of an instruction format.

Answer any FIVE Questions:-

PART B (5 x 16 = 80 Marks)

Q.No:11 is Compulsory

11.   Write a program to evaluate the following arithmetic statement :

        X = (A+B) * (C+D)

    i) Using a general register computer with three address instructions.   (4)

    ii) Using a general register computer with two address instructions.   (4)

    iii) Using a accumulator type computer with one address instructions.   (4)

    iv) Using a stack organized computer with zero-address operation   (4)
        instructions.

12.   Simplify the following Boolean function in product-of-sums form by means of a four-variable map. Draw the logic diagram with (i) OR-AND gates; (ii) NOR gates.

$F(A,B,C,D) = \sum (2,3,4,5,6,7,11,14,15)$

13.   Classify the four basic types of flip-flops with their graphic symbol and characteristic table.

14.   Specify the basics of shift microoperations with their symbolic notation and explain hardware implementation of the 4-bit combinational circuit shifter.

15.   Illustrate source and destination initiated handshaking methods with necessary diagrams.

16.   Draw the block diagram of associative memory and explain its architecture with read and write operation for a memory word.

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