U.S.N

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)
First Semester, Master of Computer Applications (MCA)
Make-up Examination; Feb - 2017
Fundamentals of Computer Organization

Time: 3 hrs *Max. Marks: 100*

*Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. Convert the following indicated base conversions :

   i) $(111110001.111)_2 = (?)_{16}$ ii) $(2751.624)_8 = (?)_{10}$

   iii) $(5827.9)_{10} = (?)_{16}$ iv) $(305.C)_{16} = (?)_2$ **12**

   v) $(2374)_8 = (?)_{10}$ vi) $(110101111)_2 = (?)_8$.

   b. List the steps to perform subtraction using r's complement. Apply for the given binary

   numbers :   **8**

   $M = 1010100, N = 1000011$.

2 a. Explain Huntington's postulates.   **8**

   b. Simplify the following Boolean function to a minimum number of literals,

   $F = xy + \overline{x}z + yz$.   **4**

   c. Express the Boolean function in a,

   i) Sum of min terms $F = A + \overline{B}C$ ii) Product of max term $F = xy + \overline{x}z$.   **8**

UNIT - II

3 a. Determine the minimal SOP and POS for the following function,

   i) $f(W, X, Y, Z) = \sum(0, 1, 2, 5, 8, 9, 10)$ ii) $f(A, B, C, D) = \sum(1, 3, 7, 11, 15) + d(0, 2, 5)$.   **10**

   b. List the rule for obtaining the NAND logic diagram from a Boolean function. Implement the

   following function with NAND gates :   **10**

   $f(X, Y, Z) = \sum(0, 6)$.

4 a. Define Full-Subtractor. Explain Full-Subtractor circuit using two Half-Subtractor.   **10**

   b. Design a BCD-to-Decimal decoder.   **10**

UNIT - III

5 a. Explain clocked JK Flip-Flop.   **10**

   b. Discuss BCD Ripple counter with state diagram, logic diagram, timing diagram and block

   diagram.   **10**

6 a. With a neat diagram, explain the Basic operational concept of a computer.   **10**

   b. Define computer. Explain various types of computers.   **6**

   c. What is Bus? Explain single bus structure.   **4**

UNIT - IV

7 a. Explain Indirect addressing mode and Indexed addressing mode with a programming example each.   10

   b. Explain the Basic Instruction types with an example.   10

8 a. How do Interrupts are enabled and disabled? Explain.   6

   b. With a neat diagram, explain how the simultaneous interrupt requests are handled?   6

   c. What is an exception? Discuss the types of exceptions.   8

UNIT - V

9 a. Explain ROM and its types.   10

   b. Explain Direct mapping and Associative mapping technique of cache memory.   10

10 a. Write a note on :

   i) Static memories (SRAM)   10

   ii) Dynamic memories (DRAM)

   b. Explain the translation process of memory address from its virtual address into physical address.   10

✳ ✳ ✳