



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 :
- $M = 1010100, N = 1000011.$
- 2 a. Explain Huntington's postulates. 8
- b. Simplify the following Boolean function to a minimum number of literals, 4
- $F = xy + \bar{x}z + yz.$
- c. Express the Boolean function in a, 8
- | | |
|--|--|
| i) Sum of min terms $F = A + \bar{B}C$ | ii) Product of max term $F = xy + \bar{x}z.$ |
|--|--|

UNIT - II

- 3 a. Determine the minimal SOP and POS for the following function, 10
- | | |
|---|---|
| i) $f(W, X, Y, Z) = \sum(0, 1, 2, 5, 8, 9, 10)$ | ii) $f(A, B, C, D) = \sum(1, 3, 7, 11, 15) + d(0, 2, 5).$ |
|---|---|
- 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

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