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

(An Autonomous Institution affiliated to VTU, Belagavi)

First Semester, Master of Computer Applications (MCA)

Semester End Examination; Jan. - 2020

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 given number system into specified number system: 12

i) $(10010.10)_2 = (?)_{10}$ ii) $(153)_{10} = (?)_8$

iii) $(465.0647)_8 = (?)_2$ iv) $(110111)_2 = (?)_8$

v) $(0.12)_{16} = (?)_{10}$ vi) $(1AF)_{16} = (?)_{10}$

b. Find the 1's and 2's complement of, 4

i) $(1011011)_2$

ii) $(0.1011100)_2$

c. List and explain the various basic logic gates. 4

2 a. Simplify using Kmap; 8

i) $F(ABC) = \sum(0, 1, 2, 3, 4, 5, 6, 7, 10, 11)$

ii) $F(w, x, y, z) = \sum(1, 3, 7, 11, 15) + \sum d(0, 2, 5)$

b. State and prove Demorgan's theorem. 6

c. Express $F = xy + x'z$ is product of max terms. 6

UNIT - II

3 a. Design full adder. 10

b. Draw a full subtractor circuit with truth table and explain its operation. 10

4 a. Discuss the basic operator concept of system with diagram. 10

b. On what factor processor performance depends? Explain each factor with performance equation. 10

UNIT - III

5 a. What is addressing modes? Explain them. 12

b. List basic instruction types and explain with an example. 8

6 a. Describe the use of DMA controller in comp system with diagram. 10

b. Define Interrupts. Explain the methods to enable and disable interrupts. 10

Contd…2

UNIT - IV

7	a.	With a neat diagram explain internal organization of memory chips.	10
	b.	Explain different types of ROM's.	10
8	a.	Explain various mapping techniques used in cache memories.	10
	b.	Write a note on synchronous DRAM's.	10

UNIT - V

9	a.	Explain the design of fast adder.	10
	b.	Explain Booth algorithm for signed operand multiplication. Give the multiplication of (+13) and (−6) operands.	10
10	a.	Explain IEEE standard for floating point number representation.	10
	b.	Explain with an example the integer division used non-restoring method.	10

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