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First Semester MCA Degree Examination, Dec.2016/Jan.2017

Computer Organization

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Convert the following:
- i) $(41)_{10} = (?)_2$
 - ii) $(0.6875)_{10} = (?)_2$
 - iii) $(10110001101011)_2 = (?)_{16}$
 - iv) $(B65F)_{16} = (?)_{10}$
 - v) $(306.D)_{16} = (?)_2$
- (10 Marks)
- b. Subtract the following:
- i) Using 10's complement subtract $72532 - 3250$.
 - ii) Using 2's complement subtract $1010100 - 1000011$.
- (06 Marks)

OR

- 2 a. State the following Boolean postulates:
- | | | |
|------------------|-------------------|----------------------|
| i) Closure | ii) Associate law | iii) Commutative law |
| iv) Identity law | v) Inverse | vi) Distributive law |
- (06 Marks)
- b. Express the Boolean function $F = A + B'C$ in sum of minterms. (04 Marks)
- c. Using K-map simplify the Boolean function $F(w, x, y, z) = \sum (0, 1, 2, 4, 6, 8, 9, 12, 13, 14)$. (06 Marks)

Module-2

- 3 a. Implement the following function using NAND gate:
- i) $F = x'y'z' + xyz'$
 - ii) $xy' + x'y$
- (04 Marks)
- b. Giving circuit diagram, truth table construct a half adder. (06 Marks)
- c. What is multiplexer? With block diagram and logic diagram, explain 4 to 1 line multiplexer. (06 Marks)

OR

- 4 a. Explain RS flip-flop using NOR gates. (06 Marks)
- b. What is decoder? Construct a 3 to 8 line decoder. (10 Marks)

Module-3

- 5 a. With neat diagram, explain basic functional unit of a computer. (06 Marks)
- b. Explain big-endian and little-endian assignments. (06 Marks)
- c. Explain the basic instruction types. (04 Marks)

OR

- 6 a. What are condition codes? Explain various condition code flags. (06 Marks)
- b. Explain any five addressing modes. (10 Marks)

Module-4

- 7 a. Write a note on assembler directives. (06 Marks)
b. Explain logical shift instructions. (10 Marks)

OR

- 8 a. With diagram, explain I/O interface for an input device. (06 Marks)
b. Explain various registers used in DMA interface. (10 Marks)

Module-5

- 9 a. With a neat diagram, explain 16×8 memory organization. (10 Marks)
b. Write a note on RAM. (06 Marks)

OR

- 10 a. Define ROM cell and explain various types of ROM. (08 Marks)
b. Explain with diagram the connection of memory to the process. (08 Marks)

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