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## Third Semester B.E. Degree Examination, June/July 2019 Computer Organization

Time: 3 hrs.

Max. Marks: 80

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

### Module-1

- 1 a. Explain the connection between processor and memory with neat diagram and show how to add  $A + B$  to form  $C$  with the help of the same diagram. (08 Marks)
- b. Write short notes on :  
(i) Performance equation (ii) SPEC Rating (08 Marks)

OR

- 2 a. What do you mean by addressing mode? Explain different types of addressing modes with example. (10 Marks)
- b. Explain shift and rotate instructions with example. (06 Marks)

### Module-2

- 3 Write short notes on :  
(i) Daisy chain (ii) Subroutine (iii) Interrupt hardware (iv) Exception (16 Marks)

OR

- 4 a. Explain how DMA (with register) is taking place in a system with necessary diagram. (08 Marks)
- b. Define Bus arbitration. Discuss different types of Bus Arbitration methods with diagram. (08 Marks)

### Module-3

- 5 a. With diagram, describe the internal organization of a  $128 \times 8$  memory chip. (08 Marks)
- b. With the diagram of basic SRAM (Static RAM) and DRAM (Asynchronous DRAM) chip (cell), explain the read and write operations on each of them. (08 Marks)

OR

- 6 a. Describe different types of cache mapping techniques (between memory to cache memory) with diagram. (10 Marks)
- b. Calculate the total capacity of a 4.8 inch disk having the following parameters:  
(i) 100 data recording surfaces (ii) 100000 tracks per surface (iii) 100 sectors per track  
(iv) Each track contains 512 bytes of data. (03 Marks)
- c. In a given system (i) hit rate ( $n$ ) = 0.5 (ii) Miss penalty ( $M$ ) = 100 ns (iii) Time to access cache memory ( $c$ ) = 100 ns. Calculate the average access time ( $t_{ave}$ ) experienced by the processor. (03 Marks)

### Module-4

- 7 a. Write down the steps of Booths multiplication algorithm. (02 Marks)
- b. Perform Booths multiplication between  $(+13) \times (-6)$ . (08 Marks)
- c. Explain generation and propagation functions used in Carry-Look-Ahead Adder. (06 Marks)

OR

- 8 a. Explain Bit-Pair Recording / Fast multiplication with example. (08 Marks)  
b. Write down the steps of restoring division algorithm. Apply Restoring division algorithm on 1000/11. (08 Marks)

**Module-5**

- 9 a. Describe Multiple Bus Organization (with diagram). (08 Marks)  
b. Write down the control sequence for execution of the instruction Add (R<sub>3</sub>), R<sub>1</sub> (08 Marks)

OR

- 10 a. What do you mean by micro-instruction? Design Basic organization of a microprogrammed control unit with diagram. (08 Marks)  
b. Describe a simple microcontroller with diagram. Also mention parallel and serial I/O port in brief. (08 Marks)

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