(Please write your Exam Roll No.) Exam Roll No.

END TERM EXAMINATION

First Semester [MCA] Nov.-Dec.-2019

Paper Code: MCA107 **Subject: Computer Organization**

Time: 3 Hours **Maximum Marks: 75**

Note: Attempt five questions in all including Q.no.1 which is compulsory. Select one question from each unit.

Q1. Attempt all questions: **(5x5=25)**

a) Make excitation table for SR, D, JK and T flip flops.

b) With the help of flow chart show the initial configuration of Instruction cycle.

c) Convert the following numerical arithmetic expression into reverse polish notation and show the stack operations for evaluating the numerical result. (7+6)/(12/(4+8)+5)

d) Explain source-initiated transfer using handshaking with the help of block diagram, timing diagram and sequence of events.

e) Construct the Boolean function for the match logic of one word in an associative memory taking into consideration a tag bit that indicates whether the word is active or inactive.

UNIT I

Q2. a) What is bidirectional shift register? With the help of circuit diagram show the working of 4 bit Bidirectional Shift Register. **(6.5)**

b) Draw a circuit for an edge triggered RS flip flop using two D types flip flops. **(6)**

Q3. a) Construct a common bus system with four MUX (4x1) and four registers. **(6.5)**

b) Design a one stage Logic diagram that performs the four Logic operations of X-OR, AND, OR & complement. Use two selection variables. **(6)**

UNIT II

Q4. a) For Micro programmed control organization discuss the function of control address register, sequencer, pipeline and subroutine register. **(6)**

b) Describe the function/ working of control unit of basic computer. **(6.5)**

Q5. a) Explain direct & indirect addressing techniques. How many references to memory needed for each type of instruction to bring an operand into a processor register? **(6)**

b) List the basic computer instructions with its symbol (three letter word) and description. **(6.5)**

UNIT III

Q6. a) What is vector processing? Explain matrix multiplication in computers with vector processors. **(6.5)**

b) Draw a space-time diagram for a 6-segment pipeline showing the time it takes to process eight tasks. **(6)**

Q7. a) With the help of block diagram explain Asynchronous Communication Interface. **(6.5)**

b) With the help of block diagram and flow chart show data transfer from an I/O device through an interface into the CPU. **(6)**

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UNIT IV

Q8. a) Draw a block diagram for a typical RAM (128x8) chip. Also, Specify the operation of RAM chip with its function table. **(6.5)**

b) What is the principle of locality of reference? Discuss the three types of mapping procedures when considering the organization of cache memory. **(6)**

Q9. a) Explain the basic components of a memory management unit. Discuss Segmented- page mapping. **(6)**

b) The logical address space in a computer system consists of 128 segments. Each segment can have up to 32 pages of 4K words in each. Physical memory consists of 4K blocks of 4K words in each. Formulate the logical and physical address formats. **(6.5)**

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