

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Questions: 09

Total No. of Pages: 02

MCA (Sem.1)
COMPUTER ORGANIZATION & ASSEMBLY LANGUAGE
Subject Code: MCA-103
Paper ID: 72709

Time: 3 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. Sections A,B, C & D contains TWO questions each carrying TEN marks and students have to attempt any ONE question from each section.
2. Section E is compulsory carrying TWO marks in EACH.
3. Use of non - programmable scientific calculator is allowed.

SECTION A

1.
 - a) What do you understand by hardwired based design and Control Unit?
 - b) Using only AND, OR, and NOT gates, design a logic circuit for a multiplexer that takes two input bits A and B and a control bit C. When C = 0, the output of the multiplexer is the value of A; when C = 1, the output of the multiplexer is the value of B
2.
 - (a) What do you understand by Microprogramming? Explain.
 - (b) What is an array processor? What are advantages of it?
 - (c) What is the basic difference between combinational and sequential logic?

SECTION B

3. What are the steps involved in the following cycles:-
 - (i) Fetch Cycle
 - (ii) Execute cycle
 - (iii) Interrupt cycle
 - (iv) Indirect cycle
4.
 - a) When a DMA controllers needs to use the bus to access memory, it performs "cycle stealing" by making the CPU wait if it is also trying to access memory. Even though the CPU is continually executing, why might the DMA device often find the bus to memory free when it needs to access memory?
 - b) Assume special I/O instructions are used to fill I/O-controller registers. Why can't a user program use these instructions to communicate with the I/O device directly and by pass the operating system's protection checking?

SECTION C

5. Give the hardware organization of associative memory. Why associative memory is faster than other memories. Deduce the logic equation used to find the match in the associative memory. Explain how four-bit argument register is realized.
6.
 - a) Give the flow chart for add and subtract operation of two signed 2's complement data. Explain the logic of each operation.
 - b) Why page-table is required in a virtual memory system. Explain different ways of organizing a page table.

SECTION D

7.
 - a) Draw the block diagram of a Computer and explain the function of each block.
 - b) How does the RISC machine provide support for subroutine calls?
8.
 - a) What are the characteristics of a Good Instruction format.?
 - b) Discuss various addressing modes with examples.
 - c) Write an assembly language program to convert a digital string into respective exactly opposite value.

SECTION E

9. Answer briefly:
 - a) What is the role of a register?
 - b) How many types of registers are there?
 - c) What is an Instruction Cycle?
 - d) What is an auxiliary memory?
 - e) What is the difference between serial and parallel processing?
 - f) What is the basic architecture of a computer?
 - g) Differentiate between synchronous and Asynchronous data transfer mode.
 - h) Mention two advantages and disadvantages of a Direct mapping technique.
 - i) Explain Virtual memory.
 - j) What are the essential difference between base and Index register addressing modes?