Roll No……..….. **Total No. of Printed Pages: 1**

Total No. of Questions: [11]

MCA (Semester – 1st)

COMPUTER ORGANIZATION AND ARCHITECTURE

Subject Code: MCAPS1104

Paper ID: [20270104]

Time: 03 Hours **Maximum Marks: 60**

Instruction for candidates:

1. Section A is compulsory. It carries 16 marks. It consists of 4 questions of 4 marks each.
2. Section B consist of 4 questions of 8 marks each. The student has to attempt any 3 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

Section – A **(4 marks each)**

Q1. Describe the role of the instruction cycle in basic computer operations. Outline its main phases.

Q2. What is Direct Memory Access (DMA) and how does it improve I/O performance in a computer system?

Q3. Explain the difference between main memory and cache memory. Why is cache memory faster?

Q4. List and briefly describe any four types of instructions in the 8085 microprocessor's instruction set.

Section – B **(8 marks each)**

Q5. Explain the design and working of a basic computer? Describe the roles of memory reference instructions and timing and control in its operation?

Q6. Discuss the general register and stack organizations in CPU architecture. Compare their advantages and disadvantages, and explain how each affects data manipulation and storage.

Q7. Explain how associative mapping works in cache memory. Give an example to illustrate the mapping process?

Q8. Outline the architecture of the 8085 microprocessor and explain the function of its main registers. Mention any four basic assembly language programming instructions manipulating these registers?

Section – C **(10 marks each)**

Q9. Define the instruction cycle? Describe its main phases, explaining the purpose of each phase. Give an example.

Q10. a) Explain the role of peripheral devices in a computer system. (4)

b) Describe the different types of input-output interfaces used to connect these devices to the CPU. Discuss the advantages and disadvantages of each type of interface in terms of speed, complexity, and application. (6)

Q11. Discuss the principles of parallel processing and pipelining in a computer system. Explain how these techniques enhance system performance?