

A-0887

Total Pages : 5

Roll No. -----

MCS-602/MIT (CS)-404

Computer System Architecture/Computer

Organization & Architecture

(MCA/MSCCS)

3rd/4th Semester Examination 2024(Dec.)

Time: 2:00 hrs

Max. Marks: 70

Note : This paper is of Seventy (70) marks divided into Two (02) Section A and B. Attempt the questions contained in these sections according to the detailed instructions given therein. Candidates should limit their answers to the questions on the given answer sheet. No additional (B) answer sheet will be issued.

P.T.O.

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Section-A (Long-Answer-Type Questions)

Note : Section 'A' contains Five (05) long-answer-type questions of Nineteen (19) marks each. Learners are required to answer any Two (02) questions only.

[2x19=38]

- Q.1. Explain the basic components of a computer system and their functions. Discuss the role of the each components and Communication Subsystems in the overall operation of a computer system.
- Q.2. What are the various addressing modes used in computer systems? Explain the significance of each mode and how do addressing modes affect the flexibility and efficiency of the instruction set?

- Q.3. Discuss the importance of the instruction set architecture (ISA) in a computer system. What are the different types of instructions in an instruction set, and how do they affect the efficiency of software execution on a computer? Provide examples of common types of instructions.
- Q.4. Explain the concept of Input/Output (I/O) processing in a computer system. Discuss the different types of I/O devices and how the CPU interacts with these devices to perform I/O operations.
- Q.5. Discuss the concept of virtual memory and how it allows a computer system to manage larger programs than physical memory alone would allow. Explain how paging works in virtual memory systems, and describe the role of the page table in mapping virtual addresses to physical addresses.

P.T.O.

Section-B (Short-Answer-Type Questions)

Note : Section 'B' contains Eight (08) short-answer-type questions of Eight (08) marks each. Learners are required to answer any Four (04) questions only.

[4x8=32]

- Q.1. Explain the architecture and functioning of the Arithmetic and Logic Unit (ALU). How does the ALU perform basic arithmetic and logical operations?
- Q.2. Describe the various types of communication protocols used for connecting I/O devices to a computer system.
- Q.3. Explain the role of cache memory in modern computer systems. Describe the different cache mapping techniques and their effect on performance.
- Q.4. Explain the difference between a microprocessor and a microcontroller.

- Q.5. What are the key advantages of using DMA for high-speed data transfer compared to programmed-controlled I/O and interrupt-controlled I/O?
- Q.6. Explain how the concept of pipelining is used in RISC processors to improve performance. Discuss the stages of instruction processing in a pipelined architecture.
- Q.7. Describe the process of instruction interpretation and execution in a CPU. Discuss the role of the program counter (PC), instruction register (IR), and the control signals in this process.
- Q.8. What are the key advantages and challenges of using a hardwired control unit for complex processors? How can the hardwired design be extended to handle multiple instruction sets and complex operations?
