

C1011

Total Pages : 4

Roll No.

MIT (CS)-404

Computer Organization and Architecture

M.Sc. Cyber Security (MSCCS-18/21)

4th Semester Examination, 2022 (June)

Time : 2 Hours]

Max. Marks : 80

Note : This paper is of Eighty (80) marks divided into two (02) Sections A and B. Attempt the questions contained in these sections according to the detailed instructions given therein.

SECTION-A

(Long Answer Type Questions)

Note : Section 'A' contains Five (05) long answer type questions of Twenty (20) marks each. Learners are required to answer any Two (02) questions only.

(2×20=40)

1. Answer the following : (4 marks each)

- (a) Give an example to distinguish computer architecture and computer organization.

- (b) What is data bus and address bus?
- (c) Define memory hierarchy.
- (d) Define word length in a computer.
- (e) What is Main Memory? How it can be classified?

2. Answer the following:

- (a) Discuss about different types of addressing modes. (10 marks)
- (b) Explain Microprogram Sequencing. (5 marks)
- (c) Discuss about the hardwired implementation of the control unit. (5 marks)

3. Answer the following: (5 marks each)

- (a) What is an instruction format? Explain different types of instruction formats in detail.
- (b) What is Cache memory? Explain the operation of cache memory.
- (c) What are replacement algorithms? What are the two strategies for handling write requests by the cache memory?
- (d) Explain the DMA module and its function.

4. Answer the following:

- (a) What is swapping? Explain. (3 marks)
- (b) Define partitioning of memory space. How many types of partitioning is possible? Explain. (7 marks)

(c) Explain about LRU page replacement algorithm. (5 marks)

(d) What is physical address and logical address? Explain. (5 marks)

5. Answer the following:

(a) Discuss how paging helps in implementing virtual memory. (7 marks)

(b) Explain the virtual memory translation and TLB with necessary diagram. (7 marks)

(c) What is page fault? How it is handled? (6 marks)

SECTION-B

(Short Answer Type Questions)

Note : Section 'B' contains Eight (08) short answer type questions of Ten (10) marks each. Learners are required to answer any Four (04) questions only. (4×10=40)

1. Answer the following :

(a) Explain Von Neumann Stored Program Concept. (3 marks)

(b) Explain the structure of IAS computer with the help of a diagram. (3 marks)

(c) Explain the Basic Computer Model and its different units? (4 marks)

2. Answer the following : (5 marks each)
- (a) What are the functions of an I/O module?
 - (b) Briefly explain the basic approaches used to minimize register-memory operations on RISC machine.
3. With block diagram show how a full adder can be designed by using two half adders and one OR gate.
4. Answer the following:
- (a) Explain the concept of instruction pipeline.
 - (b) What are the classifications of systems with parallel processing capabilities given by Flynn?
5. What is Cache memory? Explain the operation of cache memory.
6. What are the five states of a process? Explain with the help of a diagram.
7. What is virtual memory? Explain the need for virtual memory.
8. What is the difference between a direct and indirect address instruction? How many references to memory are needed for each type of instruction to bring an operand into a processor register.
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