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BENGALURU
School of Computer Science and Engineering
Mid - Term Examinations - November 2024

Semester: III

Date: 06-11-2024

Course Code: CSE2009

Time: 11.45am to 01.15pm

Course Name: Computer Organization and Architecture

Max Marks: 50

Program: B. Tech

Weightage: 25%

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

5Qx2M=10M

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|---|---|--------|----|-----|
| 1 | Define the types of buses used in a computer. | 2Marks | L1 | CO1 |
| 2 | State different methods of representing a number. | 2Marks | L1 | CO1 |
| 3 | Define word length? | 2Marks | L1 | CO1 |
| 4 | What are the basic memory operations in a computer system? | 2Marks | L1 | CO2 |
| 5 | What is meant by the term "parameter passing" in subroutines? | 2Marks | L1 | CO2 |

Part B

Answer ALL Questions. Each question carries 10 marks.

4QX10M=40M

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|---|---|--------|----|-----|
| 6 | a. Describe the basic Operational Concepts in detail | 4Marks | L2 | CO1 |
| | b. Discuss the connection between processor and memory with neat diagram. | 6Marks | L2 | CO1 |

Or

- | | | | | |
|---|---|--------|----|-----|
| 7 | a. What are the basic operation involved in instruction sequencing? | 4Marks | L1 | CO1 |
| | b. Describe the different instruction formats with examples. | 6Marks | L2 | CO1 |

- 8 a.** Explain the factors affecting the performance of a computer system 4Marks L2 C01
- b.** A program has 50 machine instructions in a straight-line code and 150 instructions in a loop that executes 30 times. The average number of basic steps needed to execute one machine instruction is 3 cycles, and the processor operates at a clock speed of 1.5 GHz. Calculate the time required for the program's execution. 6Marks L2 C01

Or

- 9 a.** What is a memory address? Explain the difference between byte-addressable and word-addressable memory. 2 Marks L1 C01
- b.** Define Big Endian and Little Endian, and explain how they differ in their byte order representation. 8 Marks L2 C01

- 10 a.** Define Addressing Mode? 2 Marks L1 C02
- b.** Explain the types of addressing modes in detail. 8 Marks L2 C02

Or

- 11 a.** What are the primary operations performed on a stack? 4 Marks L1 C02
- b.** What is the role of the stack pointer (SP) in a stack and how does it help manage data? 6 Marks L2 C02

- 12 a.** What is Read-Only Memory? Explain its types in brief. 6 Marks L1 C02
- b.** Identify and describe the key differences between SRAM and DRAM. 4 Marks L2 C02

Or

- 13 a.** What is cache memory mapping? Briefly describe different types of mapping technique. 4 Marks L2 C02
- b.** Consider a cache consisting of 256 blocks of 16 words each, for a total of 4096 words and assume main memory is addressable by 16 bit address and it consists of 4K blocks. How many bits are there in each of Tag, block/set and word fields for mapping techniques? 6 Marks L2 C02