

Computer Organization and Architecture

PART-A

UNIT 1

1. Give the example for zero-address, one-address, two-address, and three-address instructions.
2. What are the four basic types of operations that need to be supported by an instruction set?
3. What are the various ways of representing signed integers in the system?
4. What is the use of condition code register?
5. Registers R1 and R2 of a computer contain the decimal values 1200 and 2400. What is the effective address (EA) of memory operand in each of the following instructions?
 - (a) Load 20(R1), R5 ans: -1220
 - (b) Add-(R2), R5 ans: -2399
 - (c) Mov #3000, R5 ans: -3000
 - (d) Sub(R1)+, R5 ans: -1200
6. Limitation of Assembly Level Language
7. Define Assembler directive with example

UNIT 2

1. Why is the Wait-for-Memory-Function-Completed step needed when reading from or writing to the main memory?
2. State the differences between hard wired and micro programmed control.
3. Why is data bus bidirectional and address bus unidirectional in most microprocessors?
4. Why is floating point number more difficult to represent and process than integer?
5. Half adder and full adder circuit and truth table

UNIT 3

1. Define pipeline speedup
2. Define Superscalar Operation
3. Difference between Pipelining and Sequential Execution

UNIT 4

1. How many 128x8 Ram chips are needed to provide a memory capacity of 2048 bytes.
2. What will be the width of address and data buses for a 512Kx8 memory chip.

$$\begin{aligned}\text{Ans:} &= 512 * 2^{10} \\ &= 2^9 * 2^{10} = 2^{19} \\ &= 19 \text{ address lines}\end{aligned}$$

Each memory cell array contains 8 bits..therefore 8 Data lines.

3. List the factors that determine the storage device performance.

UNIT 5

1. What is the difference between a Subroutine and an Interrupt Service Routine?
2. What is the advantage of using interrupt initiated data transfer over transfer under program control without interrupt?
3. Why do we need DMA ?
4. What are the Types of Interrupt
5. How does Bus Arbitration typically work?
6. Why are interrupt marks provided in any processor
7. Mention the advantages of USB.
8. Why does DMA have priority over the CPU when both request a memory transfer?

PART-B

UNIT 1

1. Write the basic performance equation and using this equation explain how the performance of a system can be improved.

2. Define addressing mode. Classify addressing modes and explain each type with examples.

3. Compare RISC and CISC .

4. Basic Operational Concepts

4. Straight Line Sequencing

5. Basic Instruction Types

UNIT 2

1. Nano Programming Control

2. Microprogrammed Control

3. Hardwired Control

UNIT 3

1. Explain the influence on instruction set.

2. Explain branch prediction in detail

3. Explain Data path and control consideration with diagram.

4. Explain types of Hazards.

UNIT 4

1. Write notes on static memory

2. Explain synchronous and asynchronous DRAM in detail

3. Explain Virtual Memory Organization

4. Explain Associative memory in detail

UNIT 5

1. DMA

2. Bus Arbitration Schemes

3. PCI, USB, SCSI (Check univ qp)

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