

# **Bachelor of Computer Application (BCA)**

## **Second Semester**

### **Microprocessor and Computer Architecture (CAC155)**

*Dear Students, Don't limit your knowledge horizon, it's only a reference, and you can use other resources for more knowledge.*

#### **Unit 1: Fundamental of Microprocessor (5 Hrs.)**

##### **Questions:**

1. Define Microprocessor. Differentiate between Microprocessor and Microcontroller with example.
2. Explain microprocessor as a CPU.
3. Explain the organization of microprocessor based system with block diagram.
4. Explain the microprocessor architecture and its operations.
5. Explain the bus architecture of 8085 microprocessor.
6. Explain the 8085 microprocessor signals with block diagram.
7. Explain the 8085 microprocessor with its functional diagram.
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8. Explain the opcode fetch and memory read machine cycles for MVI A, 48H with timing for execution diagram.
9. Explain the 8085 microprocessor addressing modes with example.
10. List the features of 8086 microprocessor with its block diagram.
11. Write short notes on: Control and Status Signals, Flags, Instruction Cycle, Machine Cycle, T-States.

#### **Unit 2: Introduction to Assembly Language Programming (10 Hrs.)**

##### **Questions:**

1. Define Assembling. Explain the merits and demerits of Assembly Language Programming.
2. Explain the 8085 Programming model.
3. Classify the 8085 Instruction Set with example.
4. Write short notes on: Instruction word size, Data format

#### **Unit 3: Basic Computer Architecture (4 Hrs.)**

##### **Questions:**

1. Explain the role of John Von Neumann in development of computer.
2. Explain the Memory Hierarchy with diagram.
3. Explain the elements of cache design.

4. Explain the internal structure of Hard Disk.
5. Explain the concept of Stored Program Organization.
6. Demonstrate the theory of direct and indirect address with instruction format diagrams.
7. Define registers. Explain the basic computer registers with their uses.
8. Define Bus System. Explain the bus system construction mechanisms using Multiplexers and Three - state buffer gates.
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9. Explain the instruction set design issues.
10. Explain the structure of control unit of basic computer.
11. Define Instruction cycle. Explain the instruction cycle with state diagram.

#### **Unit 4: Microprogrammed Control (10 Hrs.)**

##### **Questions:**

1. Explain the Design procedure of Accumulator Logic.
2. Explain the Gate structure for controlling the LD, INR, and CLR of Accumulator.
3. Explain the components of ALU with their functions.
4. Define the Control Unit. Explain the organization of Microprogrammed Control unit.
5. Differentiate between Hardwired and Microprogrammed Control Design.
6. Explain the address sequencing procedure.
7. Explain the conditional branching mechanism.
8. What do you mean by mapping of instructions? Explain the procedure for mapping from instruction code to microinstruction address.
9. Define Microprogram. Differentiate between Symbolic and Binary microprogram with example.
10. Explain the basic requirements for designing control unit.
11. Explain the structure of Control Unit.
12. Write the role of microprogram sequencer in microprogrammed control unit.?

#### **Unit 5: Central Processing Unit (10 Hrs.)**

1. Explain the Register set with common ALU. OR Explain the general register organization
2. Define control word. Explain the procedure for determining control word for specific operation.
3. Define stack. Explain the stack organization.
4. Explain the different instruction formats with examples.
5. Explain the different types of instruction addressing modes.

6. Explain the different Data Transfer and Manipulation instruction.
7. What are control instructions? Explain the different types of program control instructions with their roles.
8. Define program interrupt. Explain the types of interrupt.
9. Write short notes on: Status bit conditions, Conditional branch instructions, Subroutine Call and Return.
10. Differentiate between CISC and RISC architecture.'

### **Unit 6: Pipeline, Vector Processing and Multiprocessors (6 Hrs.)**

#### **Questions:**

1. What is parallel processing? Explain the benefits of parallel processing.
2. Explain the classifications of parallel processing by M. J. Flynn.
3. What is pipelining? Explain the role of pipelining in computing.
4. Define instruction pipeline. Explain the four segment instruction pipeline.
5. Explain the different pipeline hazards (conflicts)?
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6. How to handle the branch instruction in pipeline? Explain.
7. Define vector processing. Explain the application areas of vector processing.
8. Explain the characteristics of multiprocessor system.
9. Explain the interconnection structure of multiprocessor system.
10. Write short notes on: Arithmetic pipeline, vector operations, matrix multiplications.

### **8086 Microprocessor Block Diagram**