

Dr. Babasaheb Ambedkar Open University
Term End Examination July – 2026

Course	: BCA	Date	: 12-07-2026
Subject Code	: BCAR-303	Time	: 11:30am to 01:45pm
Subject Name	: System Programming and Introduction to Microprocessor	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Explain the Von Neumann Architecture with a neat diagram.
2. Explain various Number Systems used in digital computers.
3. Explain the characteristics of Primary Memory and Secondary Memory.
4. Explain the architecture of the 8085 Microprocessor. Describe the functions of its registers, ALU, flag register, timing and control unit, and buses.
5. Explain Assembly Language Programming. Discuss the program development process, assembler directives, instruction format, and advantages of assembly language.

Section B

Answer the following (Attempt any four) (20)

1. Differentiate between Analog Signals and Digital Signals.
2. Explain the concept of Floating Point Representation.
3. Write a short note on Binary Addition.
4. Explain the functions of the Address Bus, Data Bus, and Control Bus.
5. Differentiate between Machine Language and Assembly Language.
6. Explain the role of Stack Pointer and Program Counter in a microprocessor.

Section C

Part – A (Multiple Choice Questions) (10)

Q.1 Which component performs arithmetic and logical operations in a computer system?

- | | |
|----------------|--------------------------|
| A) Input Unit | B) Arithmetic Logic Unit |
| C) Memory Unit | D) Output Unit |

Q.2 Which number system uses the symbols 0–7?

- | | |
|-----------|----------------|
| A) Binary | B) Decimal |
| C) Octal | D) Hexadecimal |

Q.3 Which memory retains data even after power is switched off?

- | | |
|--------|-----------------|
| A) RAM | B) Cache Memory |
| C) ROM | D) Register |

Q.4 Which bus carries memory addresses from the CPU to memory and I/O devices?

- | | |
|----------------|--------------------|
| A) Data Bus | B) Address Bus |
| C) Control Bus | D) Instruction Bus |

Q.5 Which register stores the address of the next instruction to be executed?

- | | |
|--------------------|------------------|
| A) Accumulator | B) Stack Pointer |
| C) Program Counter | D) Flag Register |

Q.6 Which instruction category transfers data between registers or memory locations?

- A) Arithmetic Instruction B) Data Transfer Instruction
- C) Branch Instruction D) Logical Instruction

Q.7 Which software converts an Assembly Language program into Machine Language?

- A) Compiler B) Interpreter
- C) Assembler D) Loader

Q.8 Which flag is affected when the result of an arithmetic operation becomes zero?

- A) Carry Flag B) Zero Flag
- C) Sign Flag D) Auxiliary Carry Flag

Q.9 Which operation converts a decimal number into its equivalent binary representation?

- A) Encoding B) Number System Conversion
- C) Normalization D) Multiplexing

Q.10 Which memory is generally used for temporary storage during program execution?

- A) ROM B) Optical Disk
- C) RAM D) Magnetic Tape

Part – B (State whether the following statements are true or false)

(10)

- 1 A byte generally consists of eight bits.
- 2 Binary numbers use only two distinct symbols.
- 3 The Control Unit coordinates the activities of all components within a computer.
- 4 Floating-point representation is suitable for representing fractional numbers.
- 5 Binary subtraction may require borrowing during computation.
- 6 Cache memory is designed to improve processor performance.
- 7 Assembly Language instructions are represented using mnemonic codes.
- 8 The Address Bus is generally unidirectional.
- 9 The Program Counter always contains the address of the next instruction to be executed.
- 10 Microprocessors execute instructions sequentially unless a control transfer instruction modifies the execution flow.
