

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

Course	: BCA	Date	: 14-Feb-2026
Subject Code	: BCAN-203/DCA-203	Time	: 03:00pm to 05.15pm
Subject Name	: Digital Electronics and Computer Organization	Duration	: 02.15 Hours
		Max. Marks	: 70

Section A

Answer the following (Attempt any three) (30)

1. Describe the five functionally independent units of a computer system and explain the function of each unit.
2. Explain basic logic gates with truth tables and logic symbols.
3. List and explain the popular logic families of integrated circuits.
4. Explain the working of different flip-flop circuits and compare them on the basis of operations.
5. What are addressing modes? Describe different types of addressing modes supported by a processor.

Section B

Answer the following (Attempt any four) (20)

1. Explain the concept of signal in data communication and discuss the two types of signals used in computer networks.
2. Explain the concept of a Multiplexer in brief.
3. Describe Excess-3 Code and Gray code with suitable examples.
4. Define Cache Memory in brief.
5. Define Instruction Cycle.
6. Define Program Interrupt.

Section C

Part – A (Multiple Choice Questions) (10)

Q-1 A digital computer performs operations using:

- | | |
|-----------------------|------------------------|
| A) Continuous signals | B) Decimal digits only |
| C) Binary digits | D) Analog voltages |

Q-2 In the binary number system, the base is:

- | | |
|------|-------|
| A) 8 | B) 10 |
| C) 2 | D) 16 |

Q-3 The hexadecimal number system uses how many distinct symbols?

- | | |
|-------|-------|
| A) 8 | B) 10 |
| C) 12 | D) 16 |

Q-4 The 2's complement of a binary number is obtained by:

- A) Changing 0 to 1 only
- B) Adding 1 to its 1's complement
- C) Subtracting from 1
- D) Dividing by 2

Q-5 Which logic gate produces output 1 only when all inputs are 1?

- A) OR
- B) NAND
- C) AND
- D) NOR

Q-6 The gate that can implement any Boolean function alone is called:

- A) Basic gate
- B) Universal gate
- C) Buffer gate
- D) Linear gate

Q-7 A half adder has how many inputs and outputs?

- A) 2 inputs, 1 output
- B) 2 inputs, 2 outputs
- C) 3 inputs, 1 output
- D) 3 inputs, 2 outputs

Q-8 In Von Neumann Architecture, instructions and data are stored in:

- A) Separate memory units
- B) Cache only
- C) Same memory
- D) ALU

Q-9 The decimal number 9 in 8421 BCD code is represented as:

- A) 1001
- B) 1111
- C) 1010
- D) 1100

Q-10 Floating-point numbers are stored using:

- A) Only mantissa
- B) Only exponent
- C) Sign, exponent, and mantissa
- D) Integer format only

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

(10)

- 1 Analog signals vary continuously with time.
- 2 Primary memory is non-volatile in nature.
- 3 In Gray code, consecutive numbers differ by only one bit.
- 4 9's complement is used for decimal subtraction.
- 5 NAND gate is the complement of the AND gate.
- 6 In Boolean algebra, $A + 0 = A$.
- 7 MSI stands for Medium Scale Integration.
- 8 In SR flip-flop, when both S and R are 1, the output is predictable.
- 9 Cache memory is slower than main memory.
- 10 In decimal to binary conversion, repeated division by 2 method is used.
