



C16-CM-IT-302

6228

**BOARD DIPLOMA EXAMINATION, (C-16)
OCTOBER/NOVEMBER—2023
DCME - THIRD SEMESTER EXAMINATION**

DIGITAL ELECTRONICS AND COMPUTER ARCHITECTURE

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. State De-Morgan's laws.
2. Define half-adder. Give logic expressions for sum and carry.
3. Define flip-flop. Explain the basic principle of operation of a flip-flop.
4. State the use of shift register as memory.
5. Define encoder and de-coder.
6. Define micro and macro operations.
7. Give three address instructions for $X = (A + B) \times (C + D)$.
8. Define opcode, operand and address.
9. What are virtual and physical addresses?
10. What is a bus system? List any two bus systems.

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** Show that two half-adder and an OR gate constitute a full adder. 10
- 12.** Write the working of JK flip-flop with block diagram, waveforms and truth tables. 10
- 13.** Explain the working of shift left and shift right registers. 10
- 14.** (a) Distinguish between asynchronous and synchronous counters. 5
(b) Construct and explain 1×4 De-multiplexer. 5
- 15.** Draw block diagram of simple accumulator based CPU and explain functions of each unit in it. 10
- 16.** Explain fixed point addition operation with a flowchart. 10
- 17.** (a) Explain one address instructions with examples. 5
(b) Explain the principle and advantage of cache memory organization. 5
- 18.** Explain handshaking procedure of data transfer. 10

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