



C20-AIM-CCB-304

**7323**

**BOARD DIPLOMA EXAMINATION, (C-20)**

**OCTOBER/NOVEMBER—2023**

**DAIM – THIRD SEMESTER EXAMINATION**

DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

Time : 3 Hours ]

[ Total Marks : 80

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**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. Convert the following binary numbers to decimal :

(a)  $(1010.11)_2$

(b)  $(11011.01)_2$

2. Simplify the Boolean expression  $(A\bar{B}+A\bar{C})(BC+B\bar{C})ABC$ .

3. Define positive and negative logic levels.

4. Define triggering.

5. What is stored program concept?

6. What are opcode, operand and address?

7. State the need for memory hierarchy.

8. Distinguish between main memory and auxiliary memory.

9. List any three peripheral devices that can be connected to a computer.

10. List three modes of data transfer.

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

**11.** (a) Simplify the Boolean function

$$F(w, x, y, z) = \Sigma(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$$

**(OR)**

(b) Explain the working of EX-OR and EX-NOR gates with truth tables.

**12.** (a) Explain the block diagram waveforms, truth tables and working of JK flipflop.

**(OR)**

(b) Explain with block diagram waveforms, truth tables and working of Master-slave flipflop.

**13.** (a) Draw and explain diagram of simple accumulator based CPU.

**(OR)**

(b) Explain different types of instructions with examples.

**14.** (a) Explain the principle of virtual memory organization in computer system.

**(OR)**

(b) Explain cache memory organization.

**15.** (a) Explain synchronous and asynchronous data transfer.

**(OR)**

(b) Explain handshaking procedure of data transfer.

**PART—C**

10×1=10

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

**16.** Explain the 4-bit parallel adder using full adders. Draw the diagram.

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