

Roll No.

Paper Code – BCA 3004

BCA 2nd Year (Semester-III) EXAMINATION, 2023-24

DIGITAL ELECTRONICS & COMPUTER

ORGANIZATION

PAPER-IV

Time : Two Hours]

[Maximum Marks : 75

Note- This paper consists of three Section A, B and C.

Carefully read the instructions of each Section in solving the question paper. Candidates have to write their answers in the given answer-copy only. No separate answer-copy (B Copy) will be provided.

Section-A

(Short Answer Type Questions)

Note- All questions are compulsory. Answer the following questions as short answer type questions. Each question carries 5 marks.

1. (A) Convert the given decimal number to equivalent octal number-

$$(125)_{10} \rightarrow (?)_8$$

- (B) Simplify the following Boolean expression using Boolean algebra-

$$B(A + B')(B + C)$$

- (C) Explain half adder with block diagram and truth table.
- (D) Differentiate between combinational & sequential circuit.
- (E) What do you understand by maxterm & minterm ?
- (F) Differentiate between static & dynamic RAM.
- (G) What do you understand by shift register ?
- (H) What do you understand by ring counter ?
- (I) What is flip flop ?

Section-B

(Long Answer Type Questions)

Note- This section contains four questions from which **one** question is to be answered as long question. Each question carries 15 marks.

2. (a) Explain all Logic gates with diagram & truth table.
(b) How many $32\text{ K} \times 1$ RAM chips are needed to provide a memory capacity of 256 K bytes ?

(Or)

3. Simplify the POS using K-map-
 $F(A, B, C, D) = \prod M(1, 3, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15)$

(Or)

4. What is Multiplexer ? Construct a 16×1 line multiplexer with two 8×1 and one 2×1 line multiplexer.

(Or)

5. Define full adder with logic circuit diagram & truth table.

Section-C

(Long Answer Type Questions)

Note- This section contains four questions from which **one** question is to be answered as long question. Each question carries 15 marks.

6. Explain working of SR & JK flip flop with logic diagram and characteristics table.

(Or)

7. (a) Explain cache memory in detail.
(b) Define virtual memory in detail.

(Or)

8. (a) Differentiate between synchronous asynchronous counter.
(b) Design 3-bit (MOD-8) asynchronous counter with state and Logic diagram.

(Or)

9. Explain types of shift register.

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