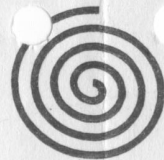


Note : This section consists of total **four** questions. Attempt **any one** question. Each question carries **15** marks. [15×1=15]

6. Design a synchronous sequential 3 bit counter using JK flip flop.
7. Simplify using K-map π (1, 3, 5, 7, 8, 8, 11, 12, 13, 15) with don't care π (1, 10, 14) in SOP and POS form.
8. What is 3 bit Ripple counter? Show its circuit. Also, explain the functioning of the circuit.
9. Discuss about Associative memory, Static RAM and Dynamic RAM. Write one use of each type of these memories in computer design.

-----XX-----



Roll No. :

Total No. of Questions : 9] [Total No. of Printed Pages : 4

BCA-3004

BCA (Semester-III) (NEP) Examination, 2024-25

(Major)

DIGITAL ELECTRONICS AND COMPUTER ORGANIZATION

[Paper : Fourth]

Time : 2 Hours]

[Maximum Marks : 75

Note :1. This paper consists of three sections **A, B** and **C**. Attempt questions from all sections as directed.

2. The candidates are required to answer only in serial order. If there are many parts of question, answer them in continuation.

3. "B" Copy will not be provided.

Section-A

Short Answer Type Questions

Note : All questions of this section are **compulsory**. Each question carries **5** marks. [9×5=45]

1. (a) What is the meaning of minterm and maxterm notation in a Boolean function? Show with a truth table.
- (b) Write the truth table representing a full adder and show its simplified output functions.
- (c) Convert hexadecimal 2A to its equivalent octal and binary.
- (d) What is flip flop? Show characteristics table of SR and JK flip flop.
- (e) Show the truth table of 2 bit comparator and its simplified output functions.
- (f) Write the no. of chip select input, no. of bits in address line, no. of bits in data line of a 4096 x 16 RAM.
- (g) What is the advantage of Cache memory organization?
- (h) State and prove De Morgan's theorem.

- (i) What is a Multiplexer? Show the example of 4x1 MUX and describe.

Section-B

Long Answer Type Questions

Note : This section consists of total **four** questions. Attempt **any one** question. Each question carries **15** marks. [15×1=15]

2. Write the truth table of XOR, NAND, NOR. Justify why NAND is a universal gate. Implement $F = AB + CD$ using only NAND gates.
3. What is Register? Write about different types of register and its categories with proper illustration.
4. Design a BCD to Excess-3 code converter following proper process of combinational circuit design.
5. What is a Decoder? Design a full adder using decoder. Design a 4x16 decoder using two 3x8 decoder.

Section-C

Long Answer Type Questions