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(Printed Pages 4)

Roll No.

**Paper Code - 0127004/0197904**

**B.C.A. 1<sup>st</sup> Sem. (Main/Back/Ex.)**

**Examination, Dec.-2024**

**Bachelor of Computer Application/**

**B.VOC (IT)**

**Digital Electronics & Computer**

**Organization**

**Time : Three Hours ] [Maximum Marks : 75**

**Note :** Attempt **all** the sections as per instructions.

**Note :** Attempt **all five** questions from **Section-A**. Attempt **any two** questions out of the following **3** questions from **Section-B**. Attempt **any three** questions out of the following **5** questions from **Section-C**.

**P.T.O.**

## **Section-A**

**Note :** Answer in brief the following:

**3×5=15**

1. Simplify  $(A.B(C+B.D)+A)C$  using Boolean laws.
2. State the differences between combinational and sequential circuit.
3. Explain Associative memory.
4. Define flip-flop. Explain any two application of it.
5. Explain EPROM and PROM.

## **Section-B**

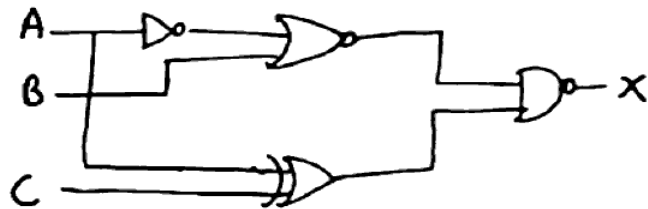
**2×7½=15**

6. (i) State and prove DeMorgan's theorem.  
(ii) Prove that NAND and NOR gates are universal gates.

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7. (i) Explain the difference in the functions of an AND gate and an OR gate.

(ii)



8. State the differences between:-

- (i) Cache Memory and Virtual Memory
- (ii) Static RAM and Dynamic RAM

**Section-C**  $3 \times 15 = 45$

9. (i) Reduce the following function using K map: <https://www.msustudy.com> 10
- $F(A, B, C, D) = \pi(0, 3, 4, 7, 8, 10, 12, 14) + d(2, 6)$
- (ii) Express the Boolean function 5

$F = XY + X'Z$  in product of maxterm

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P.T.O.

10. (i) What are the ways in which a negative number can be represented in the memory of a computer? 7.5
- (ii) Simplify  $y = (A+B)(A+B')(A'+B')$  by using laws and theorem of Boolean Algebra. 7.5
11. Give the truth table, characteristic table, excitation table and characteristic equation of SR flip flop, JK flip flop and D flip flop. 15
12. (i) Design and explain the working of Binary address subtractor. 7.5
- (ii) Summarize the design procedure for a combinational circuit. 7.5
13. (i) Define full subtractor with their working in detail. Draw the logic diagram. 7.5
- (ii) Write note on multiplexer and demultiplexer. 7.5

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