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(Printed Pages 4)

(20524)

Roll No

B.C.A.-II Sem.

18007

B.C.A. Examination, May-2024

**DIGITAL ELECTRONICS AND
COMPUTER ORGANISATION**

(BCA-204)

Time : 3:00 Hours]

[Maximum Marks : 75

Note : Attempt questions from **all** Sections as per instructions.

Section-A

(Very Short Answer Type Questions)

Note : Attempt **all** the **five** questions. Each question carries **3** marks. Very short answer is required not exceeding **75** words. $5 \times 3 = 15$

1. NAND gate is known as universal gate. Realize the basic gates from this universal gate. 3
2. Differentiate between synchronous and asynchronous counter. 3

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3. Describe SR Latch? Draw its logic circuit and its truth table. 3
4. Differentiate between static memory, dynamic memory and auxiliary memory. 3
5. In computer memory, write down the different units for memory. A memory can store 1024 words each having 8 bits. Represent this memory in K (kilo). 3

Section-B

(Short Answer Type Questions)

Note : Attempt any **two** questions.

6. Minimize the following Boolean function using K-map: 7.5
 $F(A,B,C,D) = \Sigma (0,3,6,7,9,13,14,15)$
7. An AND gate has four inputs A,B,C,D and an output Y. $2.5 \times 3 = 7.5$
 - (i) Write the Boolean expression and sequential diagram.
 - (ii) When does the above gate will give high output? Draw the truth table.
 - (iii) For \bar{Y} write the Boolean expression and sequential diagram.

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8. Describe Demultiplexer and design 1:4 demultiplexer using gates. 7.5

Section-C

(Descriptive Answer Type Questions)

Note : Attempt any **three** questions.

9. (a) Draw the logic circuit for the Boolean equation
$$Y = [AB(C + BD) + \overline{AB}]C.$$
 7.5
(b) Simplify the expression and draw logic circuit for the simplified expression. 7.5
10. Draw the circuit of a serial in parallel out shift register. Draw and explain its working. 15
11. Draw the memory hierarchy in a digital computer. Explain each memory in terms of capacity, size, access time, implementation and managed by whom? 15
12. Draw the circuits of full adder and discuss its working. Draw its truth table also. 15
13. A memory has a capacity 32K X 8. Find. 3×5=15
- (a) The numbers of words in memory.
 - (b) The numbers of bits in each word.
 - (c) The total numbers of bits in the memory.
 - (d) The total numbers of memory cells in the memory.
 - (e) Data input and data output lines.