

**18007**

**B.C.A. Examination, June-2022**

**DIGITAL ELECTRONICS AND  
COMPUTER ORGANISATION**

**(BCA-204)**

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

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

**Section-A**

**(Very Short Answer Questions)**

**Note :** Attempt all five questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words.

1. Write Demorgan's Laws. 3
2. Differentiate between flip flop and latches. 3

3. Differentiate between combinational logic circuit and sequential circuits. 3
4. Construct half subtractor using logic gates. 3
5. Draw the memory hierarchy structure and mark the arrow from low to high (Speed) & high to low (Cost). 3

**Section-B**

**(Short Answer Questions)**

**Note :** Attempt any two questions.

6. Minimize the following Boolean function using K-map-. 7½  
$$F(A,B,C,D) = \sum (3,4,5,7,9,13,14,15)$$
7. (i) Convert the SR flip flop to JK flip flop draw the truth table of JK flip flop also. 5  
(ii) Implement 4:1 multiplexer using 2:1 multiplexer 2½

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8. (i) simplify the expression: 4  
 $F(A,B,C,D) = ACD + \bar{A}B + \bar{D}$  by K-map.  
 (ii) How many flip flops are needed to  
 implement a 32 bit register. 3½

### Section-C

#### (Detailed Answer Questions)

**Note :** Attempt any **three** questions.

9. (i) Which gates are called universal  
 gates and why? 5  
 (ii) Draw a full subtractor circuit using  
 NAND gate. 10
10. What do you mean by shift register?  
 What is the need of shift register? Draw  
 & explain bidirectional shift register. 15
11. Draw and explain 4-bit binary  
 synchronous counter. 15
12. (i) Differentiate between EPROM &  
 EEPROM. 5

- (ii) Differentiate between SRAM &  
 DRAM. 5
- (iii) Differentiate between L<sub>1</sub> cache & L<sub>2</sub>  
 cache. 5
13. (i) Differentiate between ROM &  
 PROM. 3  
 (ii) Describe USB. 3  
 (iii) Differentiate between primary  
 memory and secondary memory.  
 Also list the examples of primary  
 memory and secondary memory. 3  
 (iv) Explain the concept of Virtual  
 memory. 3  
 (v) Draw basic cell of memory. 3

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