

Roll No. ....

Total Pages : 2

**43140**

**BT-3/D-24**

**DIGITAL ELECTRONICS**

**Paper : ES-207A**

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt all questions.

1. (a) Perform following operations using 1's compliment method :
    - (i)  $48-23$ .
    - (ii)  $23-(.67)$ . 5
  - (b) What are universal gates? Explain how these gates can be used as basic AND, OR and NOT gates? 5
  - (c) Simplify  $(A+B)(A'+C)$  to minimum number of literals. 5
2. (a) Explain the working of CMOS NAND gate. 7
  - (b) Minimize the expression using tabular method.  
 $F = \sum m(1, 2, 4, 5, 6, 8, 9, 10, 13) + d(3, 7, 15)$ .  
Also realize the obtained expression using AOI logic. 8

**UNIT-II**

3. (a) State and explain the working of BCD adder-subtractor with its logic diagram. 10
- (b) Design an octal to binary encoder. 5

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4. (a) Design a 4 bit even parity generator and checker. 5  
 (b) What do you mean by multiplexer? Explain the working of  $n : 1$  mux. Design a multiplexer tree for  $32 : 1$  mux using  $8 : 1$  mux. 10

### UNIT-III

5. (a) Explain the working of master slave flip flop. How it solves the problem of race around condition? 8  
 (b) Convert SR flip flop in JK flip flop. 7
6. (a) What is counter? Design an asynchronous mod-10 counter. 8  
 (b) Draw and explain the logic diagram of universal shift register. 7

### UNIT-IV

7. (a) Mention the characteristics of Digital to Analog converter. 8  
 (b) Describe working of dual slope ADC. 7
8. (a) Draw the diagram of basic RAM cell. Explain SRAM and DRAM memories. Also describe how read and write operations occur in RAM. 8  
 (b) Write a note on PLA. Also explain implementation of PLA using ROM. 7