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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech I Year II Semester Supplementary Examinations July-2021**

**SWITCHING THEORY AND LOGIC DESIGN**

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

**UNIT-I**

- 1 a Perform the following 8M  
 (i) Subtraction by using 10's complement for the given 3456 - 245.  
 (ii) Subtraction by using 2's complement for the given 111001-1010.  
 b Perform the following using BCD arithmetic(i)  $(79)_{10} + (177)_{10}$  4M

**OR**

- 2 a Obtain the Dual of the following Boolean expressions 6M  
 i.  $AB+A(B+C)+B'(B+D)$  ii.  $A+B+A'B'C$   
 b State Duality theorem. List Boolean laws and their Duals. 6M

**UNIT-II**

- 3 Minimize the given Boolean function  $F(A,B,C,D) = \sum m(0,1,2,3,6,7,13,15)$  using tabulation method and implement using basic gates. 12M

**OR**

- 4 a Simplify the Boolean function  $F(A,B,C,D)=\sum(1,3,7,11,15)+d(0,2,5)$  6M  
 b i) SOP of  $F(x, y, z)=\sum(2, 3, 6, 7)$ . 6M  
 ii) Write the advantages of Tabulation method over K-Map method.

**UNIT-III**

- 5 a Design & implement BCD to Excess-3 code converter 6M  
 b What is multiplexer? Construct 4\*1 multiplexer with logic gates and truth table 6M

**OR**

- 6 Explain Carry Look Ahead Adder circuit with the help of logic diagram. 12M

**UNIT-IV**

- 7 With a neat sketch explain MOD 6 Johnson counter using D FF. 12M

**OR**

- 8 a Design D Flip Flop by using SR Flip Flop and draw the timing diagram 6M  
 b (i) Differentiate a Latch with a Flip flop. 6M  
 (ii) Draw the block diagram of sequential circuit using combinational circuit and memory unit.

**UNIT-V**

- 9 a Implement the following Boolean function using PLA 6M  
 $F(w,x,y,z) = \sum m(0,1,3,5,9,13)$

- b Implement the following Boolean function using PAL 6M  
 $A(w,x,y,z) = \sum m(0,2,6,7,8,9,12,13)$

**OR**

- 10 Given the 8-bit data word 01011011, generate the 12-bit composite word for the hamming code that corrects and detects single errors. 12M

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