

**II B. Tech I Semester Regular Examinations, Feb/March - 2022**  
**SWITCHING THEORY AND LOGIC DESIGN**  
 (Com to ECE, EIE, ECT)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions each Question from each unit  
 All Questions carry **Equal** Marks

- 1 a) Given the 8-bit data word 01011011, generate the 12 bit composite word for the Hamming code that corrects and detects single errors. [6M]  
 b) Carry out BCD subtraction for (57) – (50) using 10's complement method. [4M]  
 c) Express the decimal 324 in Gray code form. [4M]

Or

- 2 a) Simplify the following expression  $Y=(A+B)(A+C')(B'+C')$  and implement using NAND gates. [6M]  
 b) Draw the pin diagram and obtain truth table for the following: [8M]  
     (i) IC 7400  
     (ii) IC 7408
- 3 a) Minimize the expression using Quine-McCluskey method [10M]  
 $Y = \bar{A} B C D + \bar{A} B \bar{C} D + A B \bar{C} \bar{D} + A B \bar{C} D + A \bar{B} \bar{C} D + \bar{A} \bar{B} C D$   
 b) What are the advantages and disadvantages of K-maps? [4M]

Or

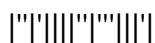
- 4 a) Design and implement BCD to Excess-3 code converter. [10M]  
 b) Draw and explain the operation of a full adder circuit using two half adder circuits. [4M]
- 5 a) Using 8:1 multiplexer realize the Boolean function: [7M]  
 $T = f(w,x,y,z) = \sum(0,1,2,4,5,7,8,9,12,13)$   
 b) Design an octal to binary encoder. [7M]

Or

- 6 a) Design a BCD to excess-3 code converter using PAL. [10M]  
 b) Compare the three combinational PLDs – PROM, PLA and PAL. [4M]
- 7 a) Draw the logic diagram of a parallel-in, Parallel-out shift register and explain its operation. [6M]  
 b) Explain the working of a master-slave JK flip flop and state its advantages. [8M]

Or

- 8 a) Design a counter with the following repeated binary sequence: 0,1,2,4,6. Use D flip-flops. [8M]  
 b) Write short notes on the following: [6M]  
     (i) IC 7474  
     (ii) IC 7493



- 9 a) Explain the capabilities and limitations of finite state machines. [6M]  
 b) Explain about state diagrams & state tables. [8M]

Or

- 10 a) Convert the following Mealy machine into equivalent Moore machine. Draw the state transition diagrams for both. [12M]

P.S	N.S			
	A		B	
	state	o/p	state	o/p
Q1	Q1	1	Q2	0
Q2	Q4	1	Q4	1
Q3	Q2	1	Q3	1
Q4	Q3	0	Q1	1

- b) When are two states said to be equivalent states? [2M]

