Code No: R2021042 **R20** SET - 1

II B. Tech I Semester Regular Examinations, Feb/March - 2022
SWITCHINNG 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
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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: (i) IC 7400 (ii) IC 7408	[8M]
3	a)	Minimize the expression using Quine-McCluskey method 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	[10M]
	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: T= f(w,x,y,z)= Σ(0,1,2,4,5,7,8,9,12,13)	[7M]
	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: (i) IC 7474 (ii) IC 7493	[6M]
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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]