

**II B. Tech I Semester Supplementary Examinations, May - 2018****SWITCHING THEORY AND LOGIC DESIGN**

(Com to ECE, EIE and ECC)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
 2. Answer **ALL** the question in **Part-A**  
 3. Answer any **FOUR** Questions from **Part-B**
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**PART -A**

1. a) Subtract 27810 from 49510 using the excess-3 subtractor. (3M)
- b) Obtain complement and dual for the given expression  $(AB+BC+AC)(EF)$  (3M)
- c) Design full adder using two half adders (2M)
- d) Explain basic structure of PLA (2M)
- e) Convert JK Flip Flop to T Flip Flop (2M)
- f) Brief about Finite State Machine (2M)

**PART -B**

2. a) The message below has been coded in the 7 bit Hamming code and transmitted through noisy channel. Decode the message assuming that at most a single error has occurred in each code word 1001001, 0111001, 1110110, and 0011011. (7M)
- b) Generate Hamming code for a 4-bit Excess-3 message to detect and correct single bit errors. (7M)
3. a) Implement the following function using only NOR gates  $F=a.(b+c.d) + (b.c)$ . (7M)
- b) Implement the following function using only NAND gates  $G=(a+b).(c.d+e)$  (7M)
4. a) Design a full-adder with two half-adders and basic gates. (7M)
- b) Convert Excess-3 code to BCD using Full adder circuits. (7M)
5. a) Implement  $f(A,B,C,D) = \sum(0,1,3,5,6,8,9,11,12,13)$  using PAL and explain its procedure. (7M)
- b) Write the merits and demerits of PROM. (7M)
6. a) Draw the circuit diagram of J-K flip flop with NAND gates with positive edge triggering and explain its operation with the help of truth table. How race around condition is eliminated. (7M)
- b) Realize D-latch using R-S latch. How it is different from D-flip flop. Draw the circuit using NAND gates and explain. (7M)



7. a) Convert the following Mealy machine into a corresponding Moore machine: (7M)

PS	NS,Z	
	X=0	X=1
A	C,0	B,0
B	A,1	D,0
C	B,1	A,1
D	D,1	C,0

- b) Design the circuit for the above table using RS flipflops. (7M)

