OReg. No.



III SEMESTER B.TECH (ELECTRICAL & ELECTRONICS ENGINEERING)

MAKE UP EXAMINATIONS, DECEMBER 2017

SUBJECT: DIGITAL ELECTRONIC CIRCUITS [ELE 2102]

REVISED CREDIT SYSTEM

Time: 3 Hours

Date: 26 December 2017

Max. Marks: 50

(05)

Instructions to Candidates:

- ✤ Answer ALL the questions.
- Missing data may be suitably assumed.
- **1A.** Given the following network, determine the functions f2 and f3. If the overall function is to be $F(A,B,C,D)=\sum m(1,3,5,7,8,10,12)+d(4,6,15)$



1B.	Find a minimal sum for the following incomplete Boolean function using Quine Mc-Cluskey method F (a,b,c,d) = $\sum m(1,2,3,4,10,11,12,14) + d(5,15)$				
					(05)
2A.	Implement Full subtractor circuit using dual 4:1 mux.				(03)
2B.	Design 4 bit excess 3 to BCD code converter using 4:16 decoders				(04)
2C.	Design a circuit using 74LS283 that will perform two digit BCD addition. Explain the logic used				(03)
3A.	A XY flip-flop has four operation clear to 0, no change, compliment and set to 1 when inputs are 00, 01,10 and 11 respectively				
	1. Derive the characteristic equation				
	2. Show how XY flip-flop can be converted to a D flip-flop				(04)
3B.	Design a MOD 13 Asynchronous UP counter using JK Flip Flops.				(03)
3C.	Design mod 96 counter using IC 7490				(03)
4A.	Design a synchronous 3 bit binary up / down counter. The counter should count up when the up/down control input is 1 and count down when up/down control input is 0. Implement the circuit using JK flip- flops.				(05)
4B.	A sequential circuit with two D Flip flops A & B, one input X and 1 output Z specified by the following equations.				
	Da =	Qa. Qb'.x+ Qb.x	: Db= x	: Z= Qa.Qb.x	
	1. Draw the logic diagram of the circuit				
	2. Derive the state table				
	3. Draw the state diagram				(03)
4C.	Draw an ASM chart to detect a sequence 101 as a mealy machine.				(02)

- **5A.** Implement the expression F = A + C using CMOS logic.
- 5B. Design a Moore state machine that has an input w and output Z, using T flip flops. The machine is a sequence detector that produces Z=1 when the sequence detected is 1100. (06)

(04)