Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EC464

Course Name: LOW POWER VLSI DESIGN

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1	a)	What is threshold voltage of MOSFET? Write down the mathematical expression. What is the effect of body voltage on threshold voltage?	(6)
	b)	Draw the energy band diagrams of MIS structure at different bias conditions.	(9)
2	a)	When MOSFET is considered as a short channel MOSFET?	(3)
	b)	What is Hot electron effect? Explain with diagram.	(6)
	c)	Derive an expression for short circuit power dissipation of a CMOS inverter.	(6)
3	a)	Explain the transistor leakage mechanisms of deep submicron transistors.	(10)
	b)	What is switching power dissipation and how it can be minimized?	(5)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	What is Domino CMOS logic? What is its advantage?	(5)
	b)	Implement the function Z = AB (C + D)(E + F)GH using three units of Domino CMOS logic.	(10)
5	a)	What are short channel effects?	(5)
	b)	How to minimize short channel effects?	(10)
6	a)	Explain the working of clocked CMOS circuits.	(5)
	b)	What is charge sharing in clocked CMOS circuits? How it can be overcome?	(5)
	c)	Implement the logic function F= (PQ + RS+T)' using clocked CMOS logic.	(5)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	Implement the function F=(A'B+AB') using 1.Fully complementary logic 2.Pass transistor Logic 3.pseudo NMOS Logic	(16)

4. DCVS logic

b) What are the advantages of DCVS logic over fully complementary logic? (4)

8 a) Draw and explain one stage adiabatic buffer. (7)

b) Draw and explain the circuit of an adiabatic CMOS AND/NAND gate. (8)

c) Briefly describe adiabatic switching. (5)

9 a) What is a pass transistor logic and complementary pass transistor logic? (10)
What is the advantage of pass transistor logic?
Why NMOS can pass only ‘weak 1’?

b) Implement F= A+B and F’=(A+B)’ using pass transistor logic. (6)

c) Explain the concept of pulsed power supplies (4)

****