Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
B.Tech Degree S6 (S,FE) / S4 (PT) (S,FE) Examination May 2023 (2015 Scheme)

Course Code: EC304
Course Name: VLSI

Max. Marks: 100   Duration: 3 Hours

PART A
Answer any two full questions, each carries 15 marks

Marks

1 a) Explain any two methods of fabricating resistors in Integrated Circuits?   (8)

   b) Distinguish between dry and wet etching?   (7)

2 a) Discuss the role of Vapour Phase Epitaxy (VPE) in IC fabrication. With schematic diagram, explain any two VPE techniques.   (9)

   b) Distinguish between Czochralski and Float Zone process of Silicon crystal growth.   (6)

3 a) Derive Deal Grove Model for thermal oxidation?   (10)

   b) Discuss the significance of Linear Rate and Parabolic rate coefficients.   (5)

PART B
Answer any two full questions, each carries 15 marks

4 a) Draw the Voltage Transfer characteristics of CMOS inverter. Explain its DC characteristics   (9)

   b) Implement 4×1 multiplexer using complementary pass transistor logic   (6)

5 a) "Transmission gate logic can transmit strong zeros and strong ones." Justify the statement   (6)

   b) Draw the circuit diagram, stick diagram and layout diagram of a 3 input CMOS NOR Gate.   (9)

6 a) List 2μm design rules for CMOS Technology?   (8)

   b) What are the various types of power dissipation in CMOS inverters? Derive an expression for the total power dissipation.   (7)

PART C

Answer any two full questions, each carries 20 marks

7   a)   With the help of suitable diagram, explain the working of NOR based ROM.   (10)

    b)   With suitable block diagrams, explain the internal architecture of Xilinx 4000 FPGA configurable logic block.   (10)

8   a)   Draw the block diagrams of carry ripple adder and carry-by pass adder. List the limitations of carry ripple adders. How carry-by pass adder overcomes the limitation of carry ripple adder.   (10)

    b)   Draw the circuit diagram of a 6T CMOS SRAM cell. With suitable circuit diagram, explain the read and write operations in 6T CMOS SRAM cell.   (10)

9   a)   Draw the circuit diagram of a one-transistor DRAM cell. Explain the read and write operation in one-transistor DRAM cells   (10)

    b)   With block diagrams, distinguish between linear carry select adder and square root carry select adder.   (10)

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