Regulation R17 *Subject code:1E6DD*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech. III Year II Semester Supplementary Examinations, June 2022

VLSI Design

(ECE)

Maximum Marks: 70 Date:22.06.2022 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1. Describe lithography
2. Define Threshold voltage.
3. List the various color coding used in stick diagram
4. Sketch a stick diagram for 2 input NAND gate
5. What is pass transistor logic?
6. What is fan-out of a gate?
7. Explain the principle of DRAM cell.
8. What is comparator?
9. Explain about FPGA
10. Discuss about controllability

Part-B

Answer All the following questions. (10M X 5=50Marks)

11 a) With neat sketches explain CMOS fabrication using n-well process 06

b) Draw CMOS inverter diagram. 04

OR

12 For nMOS inverter driven by another nMOS inverter, derive the expression for Z_{pu}/Z_{pd} ratio 10

13 Sketch the circuit schematic, stick diagram and layout of CMOS 2-Input NAND gate. 10

OR

14 Explain with neat diagram explain λ- based design rules for transistors, contact cuts and vias. 10

15 a) Write about alternative gate circuits. 05
b) What is meant by sheet resistance? 05

OR

16 a) Describe the sources of wiring capacitance 05

b) List the logical constraints of layers 05

17 a) Draw the logic diagram of zero/one detector and explain its operation. 05

b) Explain about ALU subsystem. 05

OR

18 a) Describe briefly 4-bit parallel adder. 05

b) Draw and explain the operation of SRAM cell. 05

19 a) Explain the structure and principle of PLA. 05

b) Explain the architecture of FPGA. 05

OR

20 a) What is the need for testing explain with an example 04

b) Discuss chip level testing techniques. 06