



R18 Regulation

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

Subject code: 2P5DB

B.Tech V Semester Supplementary Examinations, June 2022 VLSI DESIGN

(ECE)

Maximum Marks: 70

Date: 04.07.2022 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 the different operating regions for an MOS transistor.
- 2 What is the pass transistor.
- 3 List the types of design rules.
- 4 Sketch stick diagram for nMOS inverter.
- 5 Implement NOR logic gate using CMOS logic?
- 6 Define Super Buffers.
- 7 Sketch 1-Transistor DRAM cell.
- 8 Design a 16:1 multiplexer using 4:1 Multiplexer?
- 9 Explain self test technique testing?
- 10 What are the types of programmable devices ?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 a) Compare between CMOS and Bipolar technologies. [3]
b) Explain the fabrication of n-MOS with suitable diagram. [7]
- OR
- 12 Interpret the Pull-up to pull-down ratio (Z_{pu}/Z_{pd}) for an nMOS inverter driven by another nMOS inverter. [10]
 - 13 Sketch the stick diagram for the NMOS implemented of the Boolean expression $Y=AB+C$. [10]
- OR
- 14 Design stick diagram and layout for a CMOS inverter indicating all the regions and layers. [10]
 - 15 Explain the formal estimation of CMOS inverter delay rise time estimation and fall time estimation? [10]
- OR
- 16 Explain about driving large capacitive loads [10]
 - 17 Draw the schematic of Array Multiplier. Explain its principle and operation. [10]
- OR
- 18 Explain 6T-SRAM operation with read and write operations. [10]
 - 19 a) Explain about configurable FPGA based I/O blocks. [5]

b) Draw the schematic of PAL and explain its principle of operation. [5]

OR

20 Realize the following with the PAL

[10]

$$F1(X,Y,Z) = \sum(1,2,4,5,7) \text{ and}$$

$$F2(X,Y,Z) = \sum(0,1,3,5,7)$$