*Regulation R18* *Subject code:2P4BB*

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

## B.Tech IV Semester Supplementary Examinations, July 2022

## DIGITAL LOGIC DESIGN

**(Electrical And Electronics Engineering)**

*Maximum Marks: 70* Date:22.07.2022 **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 What is Gray code?
2 How do you obtain dual of an expression?
3 What are don't cares?
4 What is minterm? Give example.
5 Compare combinational and sequential circuits.
6 Explain about binary cell.
7 What are the basic types of shift registers?
8 Differentiate PLA and PAL.
9 Define finite state machine.
10 Explain concept of minimal cover table.

Part-B

Answer All the following questions. (5X10M=50Marks)

11 a) Convert the gray number 101101into decimal, hex, octal [5+5]
b) Perform the subtraction in BCD using 9's complement methodfor592.6-887.9

OR

12 Expand (A+D′)(A+C′)(A′+B)(A′+B+C) into max terms and min terms. [10]

13 Minimize the following expression using K-map and realize using NAND Gates.
F (A,B,C,D) = ∑m (0,1,2,9,11) +d(8,10,14,15) [10]

OR

14 Explain about Multiplexer. Design a 32X1 multiplexer using 4x1 multiplexer. [10]

15 Draw the circuit diagram of J-K flip flop with NAND gates and explain its operation with the help of truth table. How race around condition is eliminated. [10]

OR

16 a) Explain about serial in parallel out shift register with a neat diagram.
b) Design a synchronous counter with T-flip flops that goes through the binary repeated sequence 0,1,3,7,6,4,0,1….. [5+5]

17 Design a mod-12 Ripple counter using T flip flops and explain its operation. [10]

OR

18 a) Explain different types ROMs. [5+5]
b) Implement the following Boolean functions using PLA with 3 AND gates.
F1 (ABC) = ∑ (3,5,7), F2 = ∑(4,5,7).

19 Explain about sequential circuits, state table and state diagram. [10]

OR

20 Explain about Mealy machine with circuit diagram. [10]