



Regulation R18

Subject code:2P3DB

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**B.Tech III Semester Supplementary Examinations, July 2022**

**DIGITAL LOGIC DESIGN**

(Electronics and Communication Engineering)

Maximum Marks: 70

Date:21.07.2022 Duration: 3Hours

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?
- 5 Compare combinational and sequential circuits.
- 6 Explain about binary cell.
- 7 What are the basic types of shift registers?
- 8 Compare asynchronous and synchronous counters.
- 9 Explain capabilities of finite state machine.
- 10 Explain concept of minimal cover table.

Part-B

Answer all the questions

(5X10M=50Marks)

- 11 a) Convert the gray number 101101 into decimal, hex, octal [5+5]  
b) Perform the subtraction in BCD using 9's complement method for 592.6-887.9
- OR
- 12 Derive the Boolean expression for a two input Ex-OR gate to realize with the two input NAND gates without using complemented variables and draw the circuit. [10]
- 13 Expand  $(A+D')(A+C')(A'+B)(A'+B+C)$  into max terms and min terms. [10]
- OR
- 14 Minimize the following expression using K-map and realize using NAND Gates.  
 $F(A,B,C,D) = \sum m(0,1,2,9,11) + d(8,10,14,15)$ . [10]
- 15 Explain about Multiplexer .Design a 32X1 multiplexer using 4x1 multiplexer. [10]
- OR
- 16 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]
- 17 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]
- OR
- 18 Design a mod-12 Ripple counter using T flip flops and explain its operation. [10]
- 19 Explain about sequential circuits, state table and state diagram. [10]
- OR
- 20 Explain about Mealy machine with circuit diagram. [10]