



Regulation R18

Subject code: 2P4BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, February 2024**DIGITAL LOGIC DESIGN**

(Electrical and Electronics Engineering)

Maximum Marks: 70**Date: 23.02.2024 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)		CO	Bloom Tx
1	What is Gray code?	CO1	L1
2	How do you obtain dual of an expression?	CO1	L1
3	What are don't cares?	CO2	L1
4	What is minterm? Give example.	CO2	L1
5	Compare combinational and sequential circuits.	CO3	L2
6	Explain about binary cell.	CO3	L2
7	What are the basic types of shift registers?	CO4	L1
8	Differentiate PLA and PAL.	CO4	L2
9	Explain capabilities of finite state machine.	CO5	L2
10	Explain concept of minimal cover table.	CO5	L2

Part-B

Answer All the following questions. (5X10M=50Marks)			
11	a) Convert the gray number 101101 into decimal, hex, octal. [5] b) Perform the subtraction in BCD using 9's complement method for 592.6-887.9 [5]	CO1	L3 L3
OR			
12	Expand $(A+D')(A+C')(A'+B)(A'+B+C)$ into max terms and min terms. [10]	CO1	L3
13	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]	CO2	L3
OR			
14	Explain about Multiplexer. Design a 32X1 multiplexer using 4x1 multiplexer. [10]	CO2	L4
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]	CO3	L3
OR			
16	a) Explain about serial in parallel out shift register with a neat diagram. [5] b) Design a synchronous counter with T-flip flops that goes through the binary	CO3	L3 L4

	repeated sequence 0,1,3,7,6,4,0,1..... [5]		
17	Design a mod-12 Ripple counter using T flip flops and explain its operation. [10]	CO4	L4
	OR		
18	a) Explain different types ROMs. [5] b) Implement the following Boolean functions using PLA with 3 AND gates. $F1(ABC) = \sum(3,5,7)$, $F2 = \sum(4,5,7)$. [5]	CO4	L3 L4
19	Explain about sequential circuits, state table and state diagram. [10]	CO5	L3
	OR		
20	Explain about Mealy machine with circuit diagram. [10]	CO5	L3