R18 Regulation *Subject code:2P4BB*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, December 2025

DIGITAL LOGIC DESIGN
(EEE)

Maximum Marks: 70 Date:23.12.2025 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)		Marks	CO	BTL
1	What is Gray code?	2M	1	L1
2	How do you obtain dual of an expression?	2M	1	L1
3	What are don't cares?	2M	2	L1
4	Define the full subtractor.	2M	2	L1
5	Compare latch and flip flop.	2M	3	L1
6	List the applications of Multiplexers.	2M	3	L1
7	Differentiate between RAM and ROM.	2M	4	L1
8	Define the ring counter.	2M	4	L1
9	What are finite state machines?	2M	5	L1
10	Define sequential machine.	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Convert the gray number 101101into decimal, hex, octal. b) Perform the subtraction in BCD using 9's complement method for 592.6-887.9	5M 5M	1	L2
	OR			
12	Expand (A+D′)(A+C′)(A′+B)(A′+B+C) into max terms and min terms.	10M	1	L2
13	Reduce the expression using k map F(A, B, C, D, E) =Σm(0,1, 2, 3, 5,7,8,9,10,12,13) and implement the real minimal expression in universal logic.	10M	2	L2
	OR			
14	Explain about Multiplexer .Design a 32X1 multiplexer using 4x1 multiplexer.	10M	2	L2
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.	10M	3	L2

	OR			
16	What is meant by 'edge triggered'? Differentiate SR-FF and JK-FF with their functional operation and excitation tables.	10M	3	L2
17	What do you mean by universal shift register? Draw and explain its circuit diagram and operation.	10M	4	L2
	OR			
18	Design a 4-bit up/down Synchronous BCD counter using T flip flops.	10M	4	L2
19	Explain about sequential circuits, state table and state diagram.	10M	5	L2
	OR			
20	Explain about Mealy machine with circuit diagram.	10M	5	L2