R18 Regulation *Subject code:* 2P3FC/2P3EC

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Supplementary Examinations, February 2024

DIGITAL LOGIC DESIGN

(Common to CSE & IT)

Maximum Marks: 70 Date: 21.02.2024 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 which carries 10M.
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	BTL
1	Convert $(15A3)_{16}$ into decimal and binary.	CO1	L2
2	State De-Morgan's theorems.	CO1	L1
3	Implement OR gate using NAND gates only	CO2	L2
4	Define minterm and maxterm? Give example for each.	CO2	L1
5	Draw the logic circuit of a full adder and give its truth table.	CO3	L2
6	Write the functions of a decoder and multiplexer.	CO3	L1
7	Differentiate latch and flip flop.	CO4	L2
8	Draw the logic diagram of a master slave J-K flip-flop.	CO4	L2
9	Differentiate RAM and ROM.	CO5	L2
10	Define micro operation with any two examples.	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)			CO	BTL
11	A. Explain various number systems and codes and their conversion with examples for each.	5M	CO1	L2
	B. What are the various logic gates, give the representation along with the truth table.	5M		L2
	OR			
12	A. Realize XOR function using NOR logic and NAND logic.	5M	CO1	L5
	B. Given the 8 bit data word 11011011, generate the 12 bit composite word for the Hamming code that corrects and detects single errors.	5M		L5
13	A. Obtain the simplified expression in SOP form of $F(a,b,c,d)=\sum(0,2,4,5,6,7,8,10,13,15)$ using K-maps.	5M	CO2	L3
	B. Implement above simplified expression using only NOR gates.	5M		L3
	OR			
14	A. Obtain the simplified expression in product of sums. $F(A,B,C,D)=\pi(0,1,2,3,4,10,11)$.	5M	CO2	L4
	B. Implement above simplified expression using logic gates.	5M		L3
15	A. Explain the operation of 3 to 8 line decoder with the help of a truth table.	5M	CO3	L2
	B. Draw the logic diagram of a 8-line to 1-line multiplexer and explain its			L3

	working.	5M		
	OR			
16	A. Define a multiplexer? Implement the function f(x,y,z)=∑(0,2,3,5,7) using multiplexer. B. Realize a full adder using decoder.	5M 5M	CO3	L3 L3
17	A. Explain the operation of RS flip flop flip flop using its block diagrams and truth table. What are its limitations? B. Explain the operation of JK flip flop flip flop using its block diagrams and truth table. What are its limitations?	5M 5M	CO4	L2 L2
	OR			
18	A. Design 4-bit shift register using D flip-flops and explain its working. B. Design and explain Johnson counter.	5M 5M	CO4	L5 L3
19	A. Explain in brief, about logic construction of 32×4 ROM. Draw and explain the relevant logic diagram. B. List and explain different types of micro operations with relevant examples.	5M 5M	CO5	L2 L2
	OR			
20	A. Explain different types of ROMs. B. Explain the applications of Logic micro operations.	5M 5M	CO5	L2 L2