R20 Regulation *Subject code:3P3EC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech III Semester Regular/Supplementary Examinations, March/April 2023

LOGIC CIRCUITS DESIGN

(Common to CSE & CSE(AI&ML))

Maximum Marks: 70 Date:01.04.2023 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 Convert hexadecimal E79A.6B5 to binary.
2 What do you mean by self complementing codes ?Give examples.
3 Describe the importance of don't care conditions.
4 Implement a 16:1 mux using two 8:1 mux.
5 How many states do a 4 bit Johnson counter have?
6 What are the applications of shift registers?
7 What is the difference between ALU and ALSU?
8 What are shift micro operations?
9 What is the size of the decoder in a 8 x 4 ROM?
10 What is a combinational PLD?

Part-B

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

11 A. Convert the hexadecimal number 68BE to binary and then from binary convert it to octal 5M

B. Convert the following to Decimal then to Octal
$(125F)_{16}$ b) $(10111111)_2$ 5M

OR

12 Using Universal gates design three basic logic gates. 10M

13 Simplify the Boolean function using k-map in SOP and POS forms 10M
$F=\sum m(0,1,2,4,7,8,12,14,15,16,17,18,20,24,28,30,31)$

OR

14 What are the design steps for combinational circuits? Implement 4 input priority encoder. 10M

15 Explain Universal shift register in detail. 10M

OR

16 Design synchronous mod-6 counter using clocked JK flip flops. 10M

17	Explain add and subtract operation of two signed 2's complement data. Explain the logic of each operation.	10M
	OR	
18	Explain the hardware implementation of arithmetic logic shift unit in detail.	10M
19	Draw the internal logic construction of 32X4 ROM and explain how a Boolean expression is implemented using it.	10M
	OR	
20	Implement the Boolean function $f(A,B,C)=\sum m(0,1,2,3,6)$ using PLA and PAL.	10M