R18 Regulation *Subject code: 2P3FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

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

DIGITAL LOGIC DESIGN

(INFORMATION TECHNOLOGY)

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 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)

1 Reduce the following Boolean expressions to the indicated number of literals: A'C' + ABC + AC' to three literals.
2 Find the complement of the following expression: xy' + x'y
3 Implement AND gate using NAND gate.
4 Write the truth table of Ex- Nor gate.
5 Draw a logic diagram for 2 to 4 decoder using NAND gates?
6 Draw an AND gate using 2:1 MUX.
7 Define Sequential circuits.
8 Examine with the help of a block diagram, the basic components of a Sequential Circuit?
9 State the RTL Logic.
10 What are the Logic Micro operations?

Part-B

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

11 Solve for 'x' [10]

i).$(367)_8 = (x)_2$ *ii*).$(378.93)_{10} = (x)_8$ *iii*).$(B9F.AE)_{16} = (x)_8$ *iv*).$(16)_{10} = (100)_x$

OR

12 Encode the following message bits into 7-bit even parity hamming code [10]

a). $(1001)_2$ *b*). $(1110)_2$

13 Minimize the following logic function using K-maps and realize using NAND gate. [10]
F(A,B,C,D) = ∑m(1,3,5,8,9,11,15) + d(2,13)

OR

14 Minimize the following in SOP and POS forms on the 4 variable k-map. [10]
F(A,B,C,D) = ∑m(0,2,3,8,9,10,11,12,13) .

15 Design 2-bit Magnitude comparator and write truth table for it. [10]

OR

16 Construct a 4 to 16 line decoder using 2 to 4 line decoders. [10]

17 Derive the characteristic equations of SR-flip-flop , D-flip-flop. [10]

OR

18 Illustrate about a shift register? Can a shift register be used as a counter? If yes, explain how? [10]

19 A. Distinguish between RAM and ROM.
B. Compare the PAL and PLA. [5+5]

OR

20 Explain the following operations. [5+5]
i. Logic Micro operations, ii. Shift Micro operations