R18 Regulation Subject code: 2P4BB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech IV Semester Supplementary Examinations, September 2023

Digital Logical Design

(EEE)

Maximum Marks: 70 Date:24.09.2023 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 What is Gray code?
2 What are the different illegal states of BCD and XS-3?
3 What is maxterms? Give example.
4 Why is minimization of switching functions required.
5 Compare combinational and sequential circuits.
6 List the applications of Multiplexers
7 Differentiate between RAM and ROM.
8 What are drawbacks of ripple counters?
9 What is merger graph?
10 Define sequential machine.

Part-B

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

11 a) Given the 8 bit data word 11011011, generate the 12 bit composite word for the Hamming code that corrects and detects single errors. (5M)
b) Convert $(A0F9.0DC)_{16}$ to decimal, binary, octal (5M)

OR

12 Expand (A+D′)(A+C′)(A′+B)(A′+B+C) into max terms and min terms. (10M)

13 Minimize the following expression using K-map and realize using NAND Gates.
F (A,B,C,D) = ∑m (0,1,2,9,11) +d(8,10,14,15). (10M)

OR

14 Explain about Multiplexer .Design a 32X1 multiplexer using 4x1 multiplexer. (10M)

15 Explain the priority encoder with a neat logic diagram. (10M)

OR

16 What is meant by Edge triggered? Differentiate SR-FF and JK-FF with their functional operation and excitation tables. (10M)

17 Design a synchronous 3-bit Up-down counter using JK FFs. (10M)

OR

18 Design a 4-bit up/down Synchronous BCD counter using T flip flops. (10M)

19 Explain about sequential circuits, state table and state diagram (10M)

OR

20 Explain about Mealy machine with circuit diagram. (10M)