



Regulation R20

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY
(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code:3P3FA

B.Tech III Semester Supplementary Examinations, July 2022
DIGITAL LOGIC DESIGN
(Information Technology)

Maximum Marks: 70

Date:23.07.2022 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 questions.
4. Each question carries 10marks 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 Convert the number $(D9F.CE)_{16}$ into decimal.
- 3 What are don't cares?
- 4 Define the full subtractor.
- 5 Compare latch and flip flop.
- 6 List the applications of Multiplexers.
- 7 What are the drawbacks of ripple counters?
- 8 Compare asynchronous and synchronous counters.
- 9 Explain capabilities of finite state machine.
- 10 Explain concept of minimal cover table.

Part-B

Answer all the questions

(10Mx 5=50Marks)

- 11 a) Convert the gray number 101101 into decimal, hex, octal. [5+5]
b) Perform the subtraction in BCD using 9's complement method for 592.6-887.9
OR
- 12 Generate hamming code sequence for given 11-bit message
01101110101. [10]
- 13 Expand $(A+D')(A+C')(A'+B)(A'+B+C)$ into max terms and min terms.
[10]
OR
- 14 Reduce the expression using k map $F(A, B, C, D, E) = \Sigma(0,1, 2, 3, 5,7,8,9,10,12,13)$ and implement the real minimal expression in universal logic. [10]
- 15 Explain the priority encoder with a neat logic diagram. [10]
OR
- 16 Design a full-adder with two half-adders and basic gates and realize using NAND logic [10]
- 17 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. [10]
OR
- 18 Design a mod-12 Ripple counter using T flip flops and explain its operation. [10]
- 19 Explain about sequential circuits, state table and state diagram [10]
OR
- 20 Explain about Mealy machine with circuit diagram. [10]