



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: 2P3FC

B.Tech III Semester Supplementary Examinations, July 2022

DIGITAL LOGIC DESIGN

IT

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 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 are 2's complement and 9's complement of a numbers? Give examples.
- 2 State and prove De Morgan theorems.
- 3 What are minterms and maxterms? Give examples for each.
- 4 Define pair quad and octet in K-Maps and give examples.
- 5 Write down the half adder Truth table?
- 6 Define Combinational circuit.
- 7 Why flip-flops are needed in sequential circuits?
- 8 What is a register?
- 9 Write about memory decoding?
- 10 What are the advantages of PLA over ROM's?

Part-B

Answer All the following questions.

(10M X 5=50Marks)

- 11 a) Explain various number systems and codes and their conversion with examples for each.
b) Simplify the following Boolean expressions to a minimum number of literals.
(i) $ABC + A'B + ABC'$ (ii) $xy + x(wz + wz')$ [5+5]
OR
- 12 a) Express the following numbers in decimal : $(10110.0101)_2$, $(16.5)_{16}$, $(26.24)_8$.
b) Demonstrate by means of truth tables the Boolean Associative law and distributive law.
c) Simplify the Boolean expression to minimum number of literals: $(A+B)'(A'+B')$. [10]
- 13 Implement the universal logic diagram corresponding to the following Boolean expressions.
(a) $B'C + AB + ACD$ (b) $(A+B)(C+D)(A'+B+D)$ [10]
OR
- 14 Using the K-maps simplify the following and implement logic circuit. [10]
 $F(A,B,C,D) = \sum(2,3,4,5,6,7,9,11,12,13)$
- 15 Explain 4-bit carry-look adder with neat diagram and mathematical equation. [10]
OR
- 16 Explain about Magnitude comparator and decoders with an example? [10]

- 17 Explain J-K flip flops along with Race around condition and also example how to avoid. [10]
OR
- 18 Design 4-bit Up-Ripple counters. [10]
- 19 Explain the read and write operation a RAM can perform? [10]
OR
- 20 With a neat sketch explain about Bus and Memory transfers? [10]