



TKRCEET  
 Institute in Character International in Excellence

R20 Regulation

Subject code: 3P4BB

**TKR COLLEGE OF ENGINEERING AND TECHNOLOGY**

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

**B.Tech IV Semester Supplementary Examinations, December 2025**

**DIGITAL ELECTRONICS  
(EEE)**

Maximum Marks: 70

Date: 18.12.2025

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)		Marks	CO	BTL
1	What is Gray code?	2M	1	L1
2	How do you obtain dual of an expression?	2M	1	L1
3	What are don't cares?	2M	2	L1
4	What is minterm?	2M	2	L1
5	What is multiplexing?	2M	3	L1
6	List the applications of Multiplexers.	2M	3	L1
7	Compare latch and flip flop.	2M	4	L1
8	Compare asynchronous and synchronous counters.	2M	4	L1
9	Compare Mealy and Moore machines.	2M	5	L1
10	Write the procedure for state diagram reduction?	2M	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
11	a) Given the 8 bit data word 01011011, generate the 12-bit composite word for the hamming code that corrects and detects single errors. b) Perform the following arithmetic using excess-3 code. i) 386+756 ii) 267-175	5M 5M	1	L2
OR				
12	a) Convert the gray number 101111 into decimal, hex, octal. b) Explain the Binary codes with examples.	5M 5M	1	L2
13	Reduce the expression using k map $F(A, B, C, D) = \sum m(0,1, 2, 3, 5,7,8,9,10,12,13)$ and implement the real minimal expression in universal logic.	10M	2	L2
OR				
14	Simplify the expression $F(A,B,C,D) = \overline{A}\overline{B} + A\overline{B}\overline{D} + ABD + \overline{A}\overline{C}\overline{D} + \overline{A}B\overline{C}$ and implement with NAND gates only.	10M	2	L2
15	Explain the priority encoder with a neat logic diagram.	10M	3	L2
OR				

16	Explain about Multiplexer. Design a 32X1 multiplexer using 4x1 multiplexer.	10M	3	L2
17	Design a mod-12 Ripple counter using T flip flops and explain its operation.	10M	4	L2
OR				
18	a) Explain about serial in parallel out shift register with a neat diagram. b) Design a synchronous counter with T-flip flops that goes through the binary repeated sequence 0,1,3,7,6,4,0,1.....	5M 5M	4	L2
19	Explain about sequential circuits, state table and state diagram.	10M	5	L2
OR				
20	Explain about Mealy machine with circuit diagram.	10M	5	L2