



Regulation R17

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code: IP4DA

B.Tech II Year II Semester Supplementary Examinations, September 2023

SWITCHING THEORY AND LOGIC DESIGN  
(ECE)

Maximum Marks: 70

Date:13.09.2023 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 Write about positional weighted codes and non-positional weighted codes with an example.
- 2 Find the 2's complement of  
i).11101010 ii) 01111110
- 3 What is the use of the K-map.
- 4 Write short notes on parity encoder.
- 5 Define a combinational circuit with block diagram.
- 6 Difference between a latch and a flip-flop.
- 7 Define the ripple counter,
- 8 What is the SISO.
- 9 Define i) state table ii) state diagram.
- 10 Write Hazards types in sequential circuits.

Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 a) Implement AND, OR, NOR by using NAND gates only. [5]  
b) Derive the Hamming code for the sequence (101011) [5]
- OR
- 12 Simplify the following Boolean expressions using the Boolean theorems. (i)  $(A+B+C)(B'+C) + (A+D)(A'+C)$  (ii)  $(A+B)(A+B')(A'+B)$  [10]
- 13 Obtain the simplified expression in POS (product of sums) of  $F(w,x,y,z)=\pi(1,2,4,7,12,14,15)$  using K-maps [10]
- OR
- 14 a) Define a multiplexer? Draw 2:1 multiplexer for the function  $f(x,y,z)=\sum(0,2,3,5,7)$  [4]  
b) Design a 4-bit binary to gray code converter and draw the AOI logic circuit
- 15 What is the drawback of JK flip flop, Design a flip flop which overcomes this drawback and explain with neat diagram [6]  
[10]

OR

- 16 a) Convert SR flip flop to JK flip flop [5]  
b) What is the difference between D-latch and D-flip flop and draw the timing diagram for both. [5]
- 17 a) Explain about serial in parallel out shift register with a neat diagram. [5]  
b) Design a synchronous counter with T-flip flops that goes through the binary repeated sequence 0,1,3,7,6,4,0,1..... [5]
- OR
- 18 a) Design a Twisted ring counter with state table and state diagram [7]  
b) Difference between RAM and ROM [7]
- 19 Explain about Mealy and Moore machines with neat diagrams. [3]  
[10]
- OR
- 20 a) Write the steps in analyzing of sequential circuit? [5]  
b) Write capabilities and limitations of finite state machines? [5]