

**ANURAG Engineering College**

(An Autonomous Institution)

II B.Tech I Semester Supplementary Examinations, Jan/Feb-2024

**SWITCHING THEORY AND LOGIC DESIGN**

(ELECTRONICS AND COMMUNICATION ENGINEERING)

**Time: 3 Hours****Max. Marks: 75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What is the binary & octal number system?	CO1	L1	2M
2. Realize two input OR gates using input NAND gates?	CO1	L2	3M
3. What are Minterm and Maxterm?	CO2	L1	2M
4. Locate the minterms in a three variable map for $f = \sum m(0,1,5,7)$	CO2	L2	3M
5. What do you mean by triggering? List the various triggering modes with examples.	CO3	L1	2M
6. Differentiate between Latch and Flip-flop?	CO3	L2	3M
7. Compare synchronous & Asynchronous circuits	CO4	L1	2M
8. Convert RS flip-flop to D flip-flop	CO4	L2	3M
9. Draw the diagram of Mealy type FSM for serial adder.	CO5	L1	2M
10. Draw the circuit for Moore type FSM.	CO5	L2	3M

**Section B (Essay Questions)****Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) Simplify the logic function using Boolean algebra.  
 $F = ABC + BCD + ABC$  and realize using NAND gates only  
**OR**
- B) Briefly discuss about the Hamming code with suitable example. The message below has been coded in the 7-bit Hamming code and transmitted through noisy channel. Decode the message assuming that at most a single error has occurred in each code word 1101110 and 1011011. Assume even parity bit.
12. A) Design BCD to Grey code converter with an example?  
**OR**
- B) Reduce using mapping the following expression and implement the real minimal expression in universal gates.  
 $F(A, B, C, D) = \sum m(0, 2, 4, 6, 7, 8, 10, 12, 13, 15)$
13. A) Draw the logic diagram of a SR latch using NOR/NAND gates. Explain its operation using excitation table.  
**OR**
- B) Utilize fundamentals of sequential machine operation with example?
14. A) Design a synchronous modulo-12 counter using NAND gates and JK flip flops  
**OR**
- B) Design a 4-bit ripple counter with the help of state diagrams?

15. A) For the state table of the machine given below. Find the equivalent partition and a corresponding reduced machine in standard form.

CO5

L3

10M

Present State	Next State Z	
	$x=0$	$x=1$
A	D,0	H,1
B	F,1	C,1
C	D,0	F,1
D	C,0	E,1
E	C,1	D,1

**OR**

- B) Draw and explain clearly about weighing machine with a neat flow chart.

CO5

L3

10M