

**ANURAG Engineering College**

(An Autonomous Institution)

II B.Tech II Semester Regular Examinations, June/July – 2024

**DIGITAL ELECTRONICS**

(ELECTRICAL AND ELECTRONICS ENGINEERING)

**Time: 3 Hours****Max. Marks: 60****Section – A (Short Answer type questions)****(10 Marks)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. Mention the names of the gates which are called universal gates. Justify your answer.	CO1	L2	1M
2. State the absorption law of Boolean algebra.	CO1	L1	1M
3. Define Combinational circuit.	CO2	L2	1M
4. Minimization is desirable in logic circuits. Why?	CO2	L1	1M
5. Specify purpose of the Parity checker.	CO3	L1	1M
6. Mention the significance of priority Encoder.	CO3	L2	1M
7. Draw the truth table for JK flip-flop.	CO4	L2	1M
8. List out the types of shift registers.	CO4	L1	1M
9. Differentiate between volatile and non-volatile memories and provide examples of each.	CO5	L2	1M
10. How PLA differ from PAL?	CO5	L1	1M

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

11. A) Convert the following numbers with the indicated bases to decimal: i) $(4310)_5$ ii) $(198)_{12}$ iii) $(435)_8$ iv) $(345)_6$	CO1	L3	10M
<b>OR</b>			
B) Simplify the following Boolean functions to a minimum number of literals. i) $x.(x' + y)$ ii) $x + x'.y$ iii) $(x + y).(x + y')$ iv) $x.y + x'.z + y.z$ v) $(x + y).(x' + z)(y + z)$	CO1	L3	10M
12. A) Obtain the truth table of the following functions, and express each function in sum-of-minterms and product-of-maxterms form: i) $(b + cd)(c + bd)$ ii) $(cd + b'c + bd')(b + d)$	CO2	L3	10M
<b>OR</b>			
B) Simplify the following function, and implement them with two-level NAND gate circuit: $F(A, B, C, D) = AC'D' + A'C + ABC + AB'C + A'C'D'$	CO2	L3	10M
13. A) With suitable sketch explain the principle and operation of Carry Look ahead Adder.	CO3	L2	10M
<b>OR</b>			
B) Design a Binary to Gray Code convertor	CO3	L3	10M
14. A) Draw the symbol, truth table and characteristic equation for SR, JK, T and D type flip-flops	CO4	L2	10M
<b>OR</b>			
B) Design a 3-bit synchronous binary counter using JK Flipflop	CO4	L3	10M

15. A) Classify memories based on their characteristics, such as volatility and access speed. Discuss the characteristics of each memory type, including ROM and RAM. CO5 L2 10M

**OR**

B) Tabulate the PLA programming table for the four Boolean functions listed below. Minimize the numbers of product terms. CO5 L3 10M

i)  $A(x, y, z) = \sum(1, 3, 5, 6)$

ii)  $B(x, y, z) = \sum(0, 1, 6, 7)$

iii)  $C(x, y, z) = \sum(3, 5)$

iv)  $D(x, y, z) = \sum(1, 2, 4, 5, 7)$