PRN:		Course Code:	UEC305

Second Year **B. Tech** End Semester Examination Winter 2024

Digital Electronics

000195

Day and Date: Mon 2 Dec 2024 Max Marks: **100**

Time: 10:30AM To 01:30PM Duration: **03** hrs

Instructions:All questions are compulsory.

			Marks	Bloom's Level	CO
Q.1		**Attempt the following**			
	a)	Illustrate in detail any four characteristics/specifications of Digital ICs.	08	L1	CO1
	b)	Compare and contrast all the digital IC families.	08	L3	CO1
		OR			
	b)	Describe CMOS technology and its types.	08	L3	CO1
Q.2		**Attempt the following**			
	a)	Write any 4 Boolean algebraic laws and prove with the help of truth table.	08	L2	CO2
	b)	Describe the procedure to reduce the Boolean Expressions.	08	L2	CO2
		OR			
	b)	Reduce the following expressions using Boolean algebra.	08	L2	CO2
		i) $f = A+B\,[AC+(B+\bar{C})D]$			
		ii) $f = \left(\overline{A + \overline{BC}}\right)(A\bar{B} + ABC)$			
Q.3		**Attempt any two from the following**			
	a)	What is significance of Karnaugh-Map, Draw K-Maps for 2,3, and 4 variables and describe the steps to reduce the equation.	08	L1	CO3
	b)	Minimize the following in SOP form and implement using basic gates (AOI) logic.	08	L4	CO3
		i) $f=\sum m\,(0,2,3,4,5,6)$			
		ii) $f=\Pi M\,(0,1,2,3,4,7)$			
	c)	Obtain minimal POS expression for the given function & implement it in NOR logic. $f=\Pi M\,(0,3,5)$	08	L4	CO3
Q.4		**Attempt any two from the following**			
	a)	Describe half adder circuits with logic diagram and truth table.	08	L3	CO3
	b)	Design aGray to Binary Code converter.	08	L3	CO3
	c)	Design an Excess 3 to BCD Code converter.	08	L3	CO4
Q.5		**Attempt any Two of the following**			

Backlog

	a)	Explain following Flip Flops with neat schematic, Truth table and Logic symbol. i) D flip flop ii) T Flip Flop	09	L2	CO4
	b)	Describe operation of UniversalShift Register.	09	L2	CO4
	c)	Compare and contrast between combinational circuits and sequential circuits.	09	L4	CO4
Q.6		**Attempt any Two of the following**			
	a)	Illustrate the finite state machines state table and state diagram with a suitable example.	09	L4	CO4
	b)	Explain the classification of Memory Devices with a neat schematic.	09	L2	CO4
	c)	Compare and contrast between following memory devices: i)Volatile and Non-Volatile ii) SRAM vs DRAM	09	L3	CO4

*****

Backlog