Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U3B06

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Third Semester

Biomedical Engineering

21UBM306- DIGITAL LOGIC CIRCUITS

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1.	Perform the following code conversions: $(AB2)_{16} \rightarrow (?)_2 \rightarrow (?)_8 \rightarrow (?)_{10}$.	CO2- App
2.	Determine the following: $(27)_8+(74)_8=(?)_8$	CO2- App
3.	Implement the half adder using OR gate.	CO2- App
4.	Implement the AND gate using 2:1 multiplexer.	CO2- App
5.	State the purpose of sequence generator in digital circuits	CO1- U
6.	Differentiate RS flip flop and JK flip flop.	CO1- U
7.	Classify static 1 and static 0 hazards.	CO1- U
8.	Distinguish between mealy and moore machines.	CO1- U
9.	Differentiate static and dynamic RAM.	CO1- U
10.	Compare semiconductor memories and memories that use magnetic materials.	CO1- U

PART – B (5 x 16= 80Marks)

11.	(a)	Find a minimal sum–of–products for the Boolean expression $f(w,x,y,z) = \sum m(1,2,3,7,8,9,10,11,14,15)$ using tabulation method.	CO2-App	(16)
		Or		
	(b)	Simplify the expression y= π (0,1,4,5,6,8,9,12,13,14) using Karnaugh map method	CO2-App	(16)

12.	(a)	Design a 4-bit parallel adder/subtractor and explain the operation with a logic diagram.	CO2-App	(16)
		Or		
	(b)	Implement the Boolean function using 8:1 multiplexer $f(A, B, C, D) = \sum m(1,3,4,11,12,13,14,15)$.	CO2-App	(16)
13.	(a)	Design SR , JK, D and T flip flops	CO2-App	(16)
		Or		
	(b)	Design shift registers using flip flops.	CO2-App	(16)
14.	(a)	Analyze fundamental mode with pulse mode circuits and justify it	CO3-Ana	(16)
		Or		
	(b)	Design a serial binary adder using D flip flops and T flip flop for the numbers 1011 and 0110 and also justify your answer.	CO3-Ana	(16)
15.	(a)	Design a Binary-to-Gray converter similar to basic ROM Structure	CO2- App	(16)
		Or		
	(b)	Design a combinational circuit using a ROM. The circuit accepts a three bit number and outputs a binary number equal to the square of the input number.	CO2- App	(16)