

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code: U3B06**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2022

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

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)