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

Question Paper Code:R3402

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

Third Semester

Electronics and Communication Engineering

R21UEC302 – DIGITAL ELECTRONICS AND DESIGN

(Regulations R2021)

Duration: Three hours | Maximum: 100 Marks

PART A - (5 x 1 = 5Marks)

1. A register is able to hold _____ CO1-U

   (a) Data (b) Word

   (c) Nibble (d) Both data and word

2. Which one of the following has capability to store data in extremely high densities? CO1-U

   (a) Register (b) Capacitor (c) Semiconductor (d) Flip-Flop

3. How are the sequential circuits specified in terms of time sequence? CO1-U

   (a) By Inputs (b) By Outputs (c) By Internal states (d) All of the above

4. Asynchronous sequential logic circuits usually perform operations in CO1-U

   (a) identical mode (b) fundamental mode (c) reserved mode (d) reset mode

5. The Logical expression $Y = A + A'B$ is equivalent to CO2-App

   (a)$Y = A'B$ (b)$Y = AB$ (c)$Y = A' + B$ (d)$Y = A + B$

PART – B (5 x 3= 15Marks)

6. For a switching function of 'n' variables, how many distinct min terms and max terms are possible? CO1-U

7. Implement Boolean expression for EX - OR gate using NAND gates only. CO2-App

8. Design 2 to 4 decoder using the truth table CO2-App

9. Distinguish between mealy and moore machines. CO1-U

10. Differentiate synchronous and asynchronous sequential circuits. CO1-U

PART – C (5 x 16= 80Marks)

11. (a) Simplify the expression y= π (0,1,4,5,6,8,9,12,13,14) using Karnaugh map method CO2-App (16)

Or

(b) Find a minimal SoP and PoS for the expression y= $\sum m(3,4,5,7,9,13,14,15)$ using Karnaugh map method CO2-App (16)

12.	(a)	Design SR and D flip flops	CO2-App	(16)
		Or		
	(b)	Design JK and T flip flops	CO2-App	(16)
13.	(a)	Implement switching circuits with hazard free conditions.	CO2-App	(16)
		Or		
	(b)	Design a sequence detector that produces an output '1' whenever the sequence 101101 is detected.	CO2-App	(16)
14.	(a)	Design a Binary-to-Gray converter using read only memory architecture.	CO2-App	(16)
		Or		
	(b)	Design a hazard free switching circuits with relevant examples.	CO2-App	(16)
15.	(a)	Analyze the function of EX-OR using basic gates and universal gates	CO3-Ana	(16)
		Or		
	(b)	Analyze the function of EX-NOR using basic gates and universal gates	CO3-Ana	(16)