C   **Reg. No. :** ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚

Question Paper Code: U3402

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Third Semester

Electronics and Communication Engineering

21UEC302 – DIGITAL ELECTRONICS AND DESIGN

(Regulations 2021)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. The 2's complement representation of –17 is   CO1-U

    (a) 01110   (b) 01111   (c) 11110   (d) 10001

2. How many data select lines are required for selecting eight inputs?   CO1-U

    (a) 1   (b) 2   (c) 3   (d) 4

3. How many natural states will be there in a 4-bit ripple counter?   CO1-U

    (a) 4   (b) 8   (c) 16   (d) 32

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

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

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

    (a) Data   (b) Word   (c) Nibble   (d) Both data and word

PART – B (5 x 3= 15Marks)

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

7. Compare encoder and decoder.   CO1-U

8. Differentiate RS flip flop and JK flip flop.   CO1-U

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

10. How many programmable gates are needed for PROM?   CO1-U

PART – C (5 x 16= 80Marks)

11. (a) Find a minimal sum–of–products for the Boolean expression   CO2-App   (16)
$f(w, x, y, z) = \sum m(1,2,3,7,8,9,10,11,14,15)$ by using tabulation method.

Or

(b) Find a minimal sum–of–products for the Boolean expression   CO2-App   (16)
$f(A, B, C, D) = \sum (1,3,4,5,9,10,11) + \sum \varphi(6,8)$ by using the tabulation method.

12. (a) Design a combinational circuit which has three inputs and   CO2-App   (16)
produces two outputs using logic gates.

Or

(b) Design a combinational circuit that converts a four-bit gray code to   CO2 - App   (16)
binary code

13. (a) Design a SR , JK, D and T flip flops   CO2-App   (16)

Or

(b) Design a shift registers by using flip flops.   CO2-App   (16)

14. (a) Design a synchronous sequential circuit which adds the numbers   CO2-App   (16)
bit by bit.

Or

(b) Design a hazard free switching circuits with relevant examples   CO2-App   (16)

15. (a) Design a PLA circuit with an example.   CO2-App   (16)

Or

(b) Design a Binary-to-Gray converter using read only memory   CO2-App   (16)
architecture.

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