A **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 94303

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

Fourth Semester

Electrical and Electronics Engineering

19UEE403 – PRINCIPLES OF DIGITAL ELECTRONICS

(Regulations 2019)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. BCD code ranges from CO1- U

   (a) 0 to1 (b) 0 to 9 (c) 0 to 15 (d) 0 to 7

2. Identify the even parity code from the following CO1- U

   (a) 11001 (b) 1110 (c) 0111 (d)0110

3. What will be the number of selection lines in a 16 to 1 Multiplexer? CO1-U

   (a) Type- 0 (b) Type -1 (c) Type -2 (d) Type - 3

4. Find the number of the gates required to build a half adder are CO1- U

   (a) EX-OR gate and NOR gate (b) EX-OR gate and NOR gate

   (c) EX-OR gate and AND gate (d) Four NAND gates

5. What is the output of SR flip flop when S=1, R=0 is? CO1-U

   (a) 1 (b) 0 (c) No change (d) High impedance

6. What is output of D Flipflop when D=1? CO1- U

   (a) 1 (b)0 (c) No Change (d) X

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

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

8. How much storage capacity does each stage in a shift register represent? CO1- U

(a) One bit (b) two bits (c) four bits (d) eight bits

9. The Verilog HDL code starts with the keyword CO1- U

(a) always (b) module (c) end module (d) items

10. Which of the following loops are supported by verilog? CO1- U

(a) if-else loop (b) for loop (c) while loop (d) All the above

PART – B (5 x 2= 10 Marks)

11. Convert the following decimal numbers to the indicated bases CO1- U

7526.75 to (?)$_8$ b) 1856.959 to (?)$_{16}$

12. Define SOP and POS. CO1- U

13. Define a sequential logic circuit. Give an example. CO1- U

14. Define Races . CO1- U

15. Explain the purpose of developing HDL code for digital design. CO1- U

PART – C (5 x 16= 80Marks)

16. (a) Convert the following CO1- U (16)

$(147.3)_8$ to ($)_{16}$

$(010010101000)_2$ to ($)_{16}$

$(38.21)_{10}$ to ($)_2$

$(231.3)_{10}$to ($)_8$

Or

(b) Explain the types of weighted and non-weighted codes with an example for each type. CO1- U (16)

17. (a) (i) Design a Binary to Gray code converter. CO2- App (8)

(ii) Design a half adder and implement using logic gates. CO2- App (8)

Or

(b) (i) Implement the given function using 8 X 1 MUX F (*A,B,C,D*) = ∑m (0, 1,2, 6,7,8,9,10,11,12,15) CO2- App (8)

(ii) Design 3 to 8 decoder using logic gates. CO2- App (8)

18. (a) Design a sequence detector to detect the sequence 101 using JK flip-flops. CO2- App (16)

Or

(b) Design synchronous sequential circuit that goes through the count sequence 1,3,4,5 repeatedly. Use T flip-flops for your design. CO2- App (16)

19. (a) An asynchronous sequential circuit has two internal states and one output. The excitation and output function describing the circuit are as follows. Y_1= x1.x2 + x1.y2 + x2.y1 , Y_2= x2+x1.y1.y2+x1.y1 CO3- Ana (16)

Z= x1+x2

(i) Draw the logic diagram of the circuit.

(ii) Derive the transition table and output map.

Describe the behavior of the circuit.

Or

(b) An asynchronous sequential circuit is described by the following excitation and output equation. CO3- Ana (16)

Y = x1.x2 + (x1+x2).y Z= Y

(i) Draw the logic diagram of the circuit.

(ii) Derive the transition table and output map.

Describe the behavior of the circuit.

20. (a) Implement the following function using PLA, A(x,y,z)= ∑m(1,2,4,6) B(x,y,z)= ∑m(0,1,6,7) C(x,y,z)=∑m(2,6). CO2- App (16)

Or

(b) Develop Verilog code to design 8 to 1 multiplexer using dataflow and behavioural modeling. CO2- App (16)

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