



B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

ELECTRONICS & INSTRUMENTATION ENGINEERING

U18EII4202T: Digital Fundamentals and Microprocessors

COURSE OUTCOMES

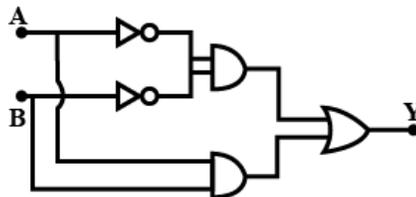
- CO1:** Summarize the fundamental concepts of number systems and logic gates.
CO2: Explain the elements of digital system abstractions such as digital representations of information, digital logic, Boolean algebra, state elements and finite state machine (FSMs).
CO3: Apply the appropriate truth table from a description of a combinational and sequential logic function.
CO4: Outline the evolution of Microprocessors and Microcontrollers.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1. Convert $8B3F_{16}$ to binary. CO1 [K₃]
2. List are the applications of octal number system? CO1 [K₂]
3. Assign the proper odd parity bit to the code 111001. CO1 [K₃]
4. If a 3-input OR gate has eight input possibilities, how many of those possibilities will result in a HIGH output? CO2 [K₃]
5. Determine the values of A, B, C, and D that make the sum term equal to zero. CO2 [K₃]
6. Write the Boolean expression for the logic circuit shown below: CO2 [K₃]



7. Define combinational logic. CO3 [K₂]
8. What is edge-triggered flip-flop? CO3 [K₂]
9. How many words can a 16x8 memory can store? CO4 [K₁]
10. What is the difference between a mnemonic code and machine code? CO4 [K₁]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

- | | | | | |
|-----|----|---|-----|-----------------------|
| 11. | a) | Convert the following: | CO1 | [K ₃] |
| | | i) $(C0B)_{16} = (\quad)_2$ | 3 | |
| | | ii) $(1101110101110110)_2 = (\quad)_8$ | 3 | |
| | b) | i) Explain the Binary codes with examples. | 5 | CO1 [K ₄] |
| | | ii) Design the circuit by Using NAND gates $F = AC + ABC + A'BC + AB + D$ | 5 | |
| 12. | a) | Given $F(A,B,C,D) = (0, 2, 4, 6, 8, 10, 14)$. Use Karnaugh map to reduce the function F, using POS form. Write a logic gate diagram for the reduced POS. | 12 | CO2 [K ₃] |
| | b) | Simplify the following Boolean expression to the minimum number of literals:
$(x + y)(x + y')$ | 4 | CO2 [K ₃] |
| 13. | a) | Draw and explain the BCD adder circuit. | 8 | CO2 [K ₂] |
| | b) | Design and explain the working of 4 x 1 MUX with neat diagrams. | 8 | CO2 [K ₃] |
| 14. | | Design a synchronous counter using D flip flop for getting the following sequence: 0, 1, 3, 5, 7, 0 | 16 | CO3 [K ₄] |
| 15. | a) | Explain the operation of universal shift register with neat block diagram. | 10 | CO3 [K ₂] |
| | b) | Compare Mealy and Moore models. | 6 | CO3 [K ₂] |
| 16. | | Describe the different types of addressing modes in a microprocessor with examples. | 16 | CO4 [K ₂] |
