KUMARAGURU
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B.TECH. DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Second Semester

INFORMATION TECHNOLOGY

U18ITI2201: Digital Logic and Microprocessor

COURSE OUTCOMES

CO1: Demonstrate the knowledge of logic gates, Boolean algebra, minimization techniques and apply to design a combinational circuit.

CO2: Analyse and design sequential circuits.

CO3: Program 8086 for the given problems.

CO4: Interface 8086 with peripheral devices.

**Time: Three Hours**   **Maximum Marks: 100**

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

1.	What are the different kinds of methods adapted to reduce Boolean function.	CO1	[K_1]
2.	Define duality property.	CO1	[K_1]
3.	Draw the block diagram of a sequential circuit.	CO1	[K_2]
4.	Illustrate the circuit diagram to convert a T-FF into a D-FF.	CO2	[K_2]
5.	Define state diagram.	CO2	[K_L]
6.	What is meant by programmable counter?	CO2	[K_1]
7.	Define the term ALE in 8086.	CO3	[K_1]
8.	List the general-purpose registers in 8086.	CO3	[K_1]
9.	Recall the master-slave connection in 8259.	CO4	[K_1]
10.	Classify data transfer types supported by 8237?	CO4	[K_2]

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

11.	a)	Determine the combination circuit for Half adder.	4	CO1	[K₂]

11. a) Determine the combination circuit for Half adder.   4   CO1   [K_2]

    b) Using a Karnaugh map method obtain the minimal SOP and POS expressions for the given function. $F(x, y, z, w) = \sum m(1, 3, 4, 5, 6, 7, 9, 12, 13)$ 12   CO1   [K_2]

12. Minimize the following using Karnaugh map. Implement the relevant function using NOR gates only, $F(A, B, C, D, E) = \pi M(2, 4, 7, 9, 26, 28, 29, 31)$ 16   CO1   [K_3]

13. a) Explain the working principle of master-slave JK flip-flop.   8   CO2   [K_2]

    b) Outline the circuit of clocked RS flip-flop and explain with truth table.   8   CO2   [K_2]

14. a) Distinguish between the Moore machine from Mealy machine.   4   CO2   [K_4]

    b) For the state diagram shown in given figure, design a synchronous sequential circuit using JK flip-flop.   12   CO2   [K_2]
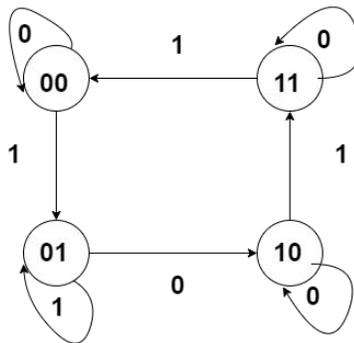
15. a) Explain the addressing modes of 8086 with examples.   10   CO3   [K_2]

    b) Interpret the following assembly directives.   6   CO3   [K_2]

    i) SHORT;   ii) TYPE;   and   iii) FAR PTR

16. a) Illustrate and explain the interfacing between 8086 and two 8259 PIC connected in master-slave configuration.   8   CO4   [K_2]

    b) Briefly explain the functions of 8255.   8   CO4   [K_2]

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