Register Number:……..

KUMARAGURU
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**B.E. DEGREE EXAMINATIONS: APRIL / MAY 2023**

(Regulation 2018)

Second Semester

**COMPUTER SCIENCE AND ENGINEERING**

U18CSI2202: Digital Logic and Microprocessor

**COURSE OUTCOMES**

**CO1:** Demonstrate how the logic gates and minimization techniques work.
**CO2:** Design a combinational circuit for performing arithmetic functions.
**CO3:** Analyze and study a few sequential circuits.
**CO4:** Develop programing code with 8086 for the basic problems.
**CO5:** Perform interfacing of 8086 with peripherals.

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

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

| | | | |
|---|---|---|---|
| 1. | Draw a 8x1 MUX circuit. | CO1 | [$K_2$] |
| 2. | Find the complement of the function x'yz' + x'y'z by using DeMorgan's law. | CO1 | [$K_2$] |
| 3. | How do you convert a JK-FF to a T-FF? | CO2 | [$K_2$] |
| 4. | What is the need for clear and preset inputs? | CO2 | [$K_1$] |
| 5. | Illustrate the circuit diagram of a MOD-10 counter. | CO3 | [$K_2$] |
| 6. | Differentiate between combinational and sequential circuits. | CO3 | [$K_2$] |
| 7. | When you add the two hex numbers 38 and 2F, what is the result of status flags of 8086? | CO4 | [$K_2$] |
| 8. | What does interrupting a Microprocessor mean? What are types of Interrupts present in 8086? | CO4 | [$K_1$] |
| 9. | Outline the use of 8251 USART. | CO5 | [$K_2$] |
| 10. | Mention the two different operation modes of keyboards. | CO5 | [$K_1$] |

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

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | Design a Binary to gray code converter. | 8 | CO1 | [$K_2$] |
| | b) | Simplify F= ∑(2, 3, 4, 5, 7, 8, 10, 13, 15) using Karnaugh map and express the answer in SOP form. Implement the same using only NAND gates. | 8 | CO1 | [$K_2$] |
| 12. | a) | Design a 4-bit ripple counter using T-FF. | 8 | CO2 | [$K_2$] |
| | b) | Explain how you design a 4-bit Ring counter. | 8 | CO2 | [$K_2$] |
| 13. | | Illustrate the working of a Successive approximation A/D converter. | 16 | CO3 | [$K_2$] |
| 14. | a) | Enumerate on the different Data Transfer Instructions of 8086. | 8 | CO4 | [$K_2$] |
| | b) | Illustrate the various Addressing modes of 8086. | 8 | CO4 | [$K_2$] |
| 15. | a) | Summarize the Architecture of 8086 Microprocessor. | 10 | CO4 | [$K_2$] |
| | b) | Write an assembly language program for calculating the factorial of a number using 8086 microprocessor. | 6 | CO4 | [$K_2$] |
| 16. | | Explain the function of 8257 DMA controller. | 16 | CO5 | [$K_2$] |

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