Register No.: .... Name: ....

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH DEGREE EXAMINATION (S), FEBRUARY 2023
ELECTRICAL AND ELECTRONICS ENGINEERING
(2020 SCHEME)

Course Code :   **20EET303**

Course Name: **Microprocessors and Microcontrollers**

Max. Marks: **100**   **Duration: 3 Hours**

PART A
(Answer all questions. Each question carries 3 marks)

1. With suitable examples, explain different types of instructions based on the byte size for 8085 Microprocessor.
2. Explain the terms T state, machine cycle and instruction cycle in 8085 microprocessor with an example.
3. Explain the instructions: (i) XCHG and (ii) MVI M, 56_H
4. Differentiate between conditional and unconditional branching operations of 8085 Microprocessor.
5. With graphical representation, explain hard and soft real time systems.
6. Explain the internal RAM structure of 8051 Microcontroller.
7. Mention bit level and byte level operations in 8051 Microcontroller. Give examples.
8. Explain the directives in 8051 Microcontroller.
9. List the interrupts in 8051 Microcontroller?
10. Give any three math functions used in programming an Arduino.

PART B
(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) With a neat sketch explain the architecture of 8085 Microprocessor.   (10)
    b) List the flags in 8085 Microprocessor. Analyse the effect of flags on the execution of instructions.   (4)

OR

12. a) Draw and explain the timing diagram for the instruction STA 3001_H in 8085 Microprocessor.   (10)
    b) Differentiate between the implicit addressing mode and immediate addressing mode with suitable examples.   (4)

MODULE II

13. a) Write an ALP for converting a BCD number to hexadecimal number.   (10)

     b) Explain the instructions CALL and RETURN with suitable example.   (4)

OR

14. a) Write an ALP program to generate a delay using register pair. Calculate the maximum delay possible. Consider the frequency of the crystal to be 6 MHz.   (8)

     b) Discuss the term stack. Explain the stack operations with suitable examples.   (6)

MODULE III

15. a) Write and assembly language program to display hexadecimal numbers 0 to 9 on a seven-segment display, using port A of 8255 PPI.   (10)

     b) Explain the challenges in embedded systems.   (4)

OR

16. a) Design an interfacing circuit for two 8K ROM and one 16K RAM memory chips to 8085 Microprocessor. Give the address range for the same.   (8)

     b) Draw the architectural block diagram for 8051 Microcontroller.   (6)

MODULE IV

17. a) Write an embedded C program for 8051 Microcontroller to generate a square wave with 50% duty cycle.   (8)

     b) Explain the addressing modes of 8051 Microcontroller with examples.   (6)

OR

18. a) Explain the ports of 8051 Microcontroller with its functions.   (7)

     b) Write an assembly language program to divide two numbers given in memory and store the result in 8051 Microcontroller.   (7)

MODULE V

19. a) Write an assembly language program to transfer letter "A" serially at a baud rate of 4800, continuously.   (6)

     b) Giving the bit pattern, explain TCON and TMOD special function registers of 8051 Microcontroller.   (8)

OR

20.   a)   Interface an ADC with 8051 Microcontroller. Write the program for interfacing and explain the same.   (8)

        b)   Write an embedded C program to configure timer one as counter in mode 2.   (6)

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