Register No.: …… Name: ……..

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FOURTH SEMESTER B.TECH DEGREE EXAMINATION (S), SEPT 2022
ELECTRONICS AND COMMUNICATION ENGINEERING
(2020 SCHEME)

Course Code : **20ECT206**

Course Name: **Computer Architecture and Microcontrollers**

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

PART A

(Answer all questions. Each question carries 3 marks)

1. Represent (-0.125) in floating point number system.
2. What are the roles of a Program counter in a processor?
3. Describe the function of Program Status Word (PSW) in 8051 microcontrollers.
4. Write the operations happening in the following instructions.
   (i) MUL AB
   (ii) CJNE A, 25H, Down
   (iii)XRL A, #25H
5. List the advantages of Embedded C programming over Assembly Language Programming.
6. Write a program to subtract the contents of external RAM locations 2100H and 2101H. Store result at 2102H.
7. Give the structure of SCON register.
8. Differentiate between compiler and interpreter.
9. Explain the write-through and write-back cache protocols.
10. Explain the concept of DMA.

PART B

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

MODULE I

11. a) Differentiate Von-Neumann and Harvard architecture. (6)
    b) Describe in detail the steps that the processor should perform to execute any given instruction. (8)

OR

12. a) Explain the internal architecture of a general processor. (6)
    b) Explain Booth's Multiplication algorithm. (8)

MODULE II

13. a) With a neat diagram explain the architecture of 8051microcontroller. (10)
    b) Mention the differences between the following instructions.
       (i) RET and RETI (4)
       (ii) XCH and XCHD

OR

14. a) With suitable example explain the addressing modes of 8051. (10)
    b) Explain with example the Boolean instructions in 8051. (4)

MODULE III

15. a) Write a program to add 10 BCD numbers stored in successive memory locations starting from 15H in internal RAM location and store the result at locations 30H and 31H. (6)
    b) With suitable diagram explain the LCD interfacing with 8051 microcontroller. (8)

OR

16. a) Write an ALP to sort the given numbers in descending order. (6)
    b) Explain keyboard interfacing with 8051 microcontroller with a neat circuit diagram. (8)

MODULE IV

17. a) Explain the architecture of ARM 7. (8)
    b) Write a program to transfer the number 35H serially at a Baud rate of 9600 using 8051. Assume suitable XTAL frequency. (6)

OR

18. a) Explain in detail ARM 7 Programmers model. (8)
    b) Explain the timer modes of 8051 in detail. (6)

MODULE V

19. a) Explain in detail about the Cache memory mapping techniques. (10)
    b) What happens if a program generates an access to a page that is not in the main memory? (4)

OR

20. a) Explain in detail the address translation in virtual memory (10)
    b) What are the drawbacks of both programmed and interrupt-driven I/O? Is there a different way to transfer I/O data? (4)

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