Reg. No. :

Question Paper Code : 40493

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Fifth Semester

Electrical and Electronics Engineeering

EE 8551 — MICROPROCESSORS AND MICROCONTROLLERS

(Common to Electronics and Instrumentation Engineering/
Instrumentation and Control Engineering)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the functions of an accumulator?

2. List the 16-bit registers of 8085 microprocessor.

3. What is an operand?

4. Write an assembly language program to add two 8 bit numbers stored at address 2020 and address 2021 in 8085 microprocessor. The starting address of the program is taken as 2000.

5. Show how the flag register is affected by the following instruction

    MOV A,#0F5H

    ADD A,#0AH

6. List the alternate functions of port 3 in the 8051 microcontroller.

7. Specify the bit of a control word for 8255, which differentiates between the I/O mode and the BSR mode.

8. List the various modes of 8254 Timer.

9. Identify the row and column of the pressed key for each of the following :

   (a) D3 – D0 = 1110 for row, D3 – D0 = 1011 for the column

   (b) D3 – D0 = 1101 for the row, D3 – D0 = 0111 for the column.

10. Assume that a stepper motor is running in full-step mode with step angle = 1.8 deg. How many steps are required to make 2 full rotations?

PART B — (5 × 13 = 65 marks)

11. (a) With the help of neat diagram explain the architecture of 8085 microprocessor in detail. (13)

   Or

   (b) Draw the microprocessor bus timing for the instruction STA 2022 H and explain it. (13)

12. (a) With suitable examples, explain the addressing modes of 8085. (13)

   Or

   (b) Explain the function of the following instructions with one example. (13)
       (i) LXI
       (ii) HLT
       (iii) LDAX
       (iv) CMP
       (v) STA
       (vi) SHLD.

13. (a) Discuss in detail about memory organization and the expansion of memory in 8051 with a neat diagram. (13)

   Or

   (b) Explain the interrupt structure of 8051 microcontroller and also explain how interrupts are prioritized. (13)

14. (a) Draw and explain block diagram of 8259A programmable interrupt controller in detail. Explain control word definition of the same. (13)

   Or

   (b) With neat block diagram, explain the description and function of 8254. (13)

15. (a) Write in detail about the interfacing of LCD with 8051 microcontroller. (13)

   Or

   (b) Describe the basic operation of stepper motor and also discuss how to interface a stepper motor with 8085 microprocessor. (13)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Write a program to arrange first 10 numbers from memory address 3000H in an ascending order in 8085. (8)

(ii) Interface an 8-bit ADC with 8051 and write ALP to get 1000 samples of input data each taken at a time interval of 50 micro seconds and store the result in external data memory from the address 2000H. Crystal frequency = 12 MHz. (7)

Or

(b) Draw the interfacing diagram and write 8051 program for interfacing 4 × 4 matrix keyboard and display the key number in Port 0. (15)

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