Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 20980

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fourth Semester

Electrical and Electronics Engineering

EE 3404 — MICROPROCESSOR AND MICROCONTROLLER

(Regulations 2021)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the significance of HOLD signal in 8085 microprocessor?

2. Specify the Status and Control signal values for different machine cycles in 8085 microprocessor?

3. Write the functionality of DAA instruction with appropriate example?

4. Illustrate the steps necessary to add ten bytes of data stored in memory locations starting at a given location, and display the sum.

5. Mention the prominent features of 8255.

6. What are the two modes of 7-segment display operations in 8279?

7. Define the contents in program status word.

8. State the methodology of RAM allocation in 8051 microcontroller.

9. Comment on the organization of program memory and data memory in PIC 16 series microcontroller?

10. Write the functionality of INCFSZ f, d instruction in PIC 16 series microcontroller.

PART B — (5 × 13 = 65 marks)

11. (a) With a neat sketch, briefly explain the interrupt structure of 8085 microprocessor.   (13)

Or

    (b) Draw and explain the timing diagram of CALL instruction in 8085 microprocessor.   (13)

12. (a) Illustrate the contents of the stack memory and registers when PUSH and POP instructions are executed, and explain how memory pointers are exchanged. (13)

Or

(b) Write an assembly language program to perform bubble sorting operation. (13)

13. (a) With a neat circuit diagram/functional block diagram, interface an analog sensor with 8085 microprocessor. Also, write an assembly language program to read, convert the sensor value and save the result in 8000H. (13)

Or

(b) Briefly explain the different modes of operation in 8254 IC? Support the answer with appropriate timing diagrams. (13)

14. (a) Discuss in detail about the methodology involved in configuration, Data transmission and reception via UART module in 8051 microcontroller. Assume a crystal oscillator of 11.059 MHz is connected to a microcontroller for achieving 19200 baud rate. Also, calculate the value of TH1 to be loaded in order to achieve the desired baud rate. Support the data transmission and reception part via assembly language programming. (13)

Or

(b) With a neat circuit diagram and assembly language program, briefly explain the process of interfacing a unipolar stepper motor with 8051 microcontroller in 4-step sequence/bi- phase mode. (13)

15. (a) With a neat sketch, describe the features and architecture of PIC16F877 microcontroller. (13)

Or

(b) With a neat sketch, detail the interrupt structure supported in PIC16F877 microcontroller. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Design an 8085-microprocesor based system with 2K × 8 RAM and 1K × 8 EPROM memory. (15)

Or

(b) Design an 8051 based temperature monitoring system using LED array connected to P3. Assume that a temperature sensor output connected to ADC0808IC (8-bit ADC) is in the voltage range between 0V to 5V. (15)

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