Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90205

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Fifth Semester

Electrical and Electronics Engineering

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. List two major differences between INTR and the other hardware interrupts.
2. Does the 8085 support externally initiated operations. If yes, how ?
3. Illustrate the changes made to the content of registers during the execution of the instruction LXI B, 4000 H.
4. State the advantages of subroutine.
5. Can single bit of a port be accessed in 8051 ? If yes, how ? Give an example.
6. What are the flags supported by 8051 microcontroller ?
7. Differentiate programmed I/O and interrupt driven I/O.
8. Why an interface is needed in between CPU and input-output devices ?
9. Write a program to load the accumulator with the value 82H and complement the accumulator 700 times.
10. List any four applications of 8051 to automation systems.

PART – B (5×13=65 Marks)

11. a) With a functional block diagram, briefly discuss the architecture of the 8085 microprocessor.

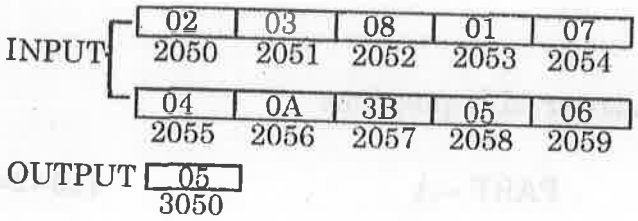
(OR)

b) Draw the timing diagram of the instruction MVI B, 45. Assume the memory address of the opcode and the data is 2000H and 2001 H respectively.

12. a) i) Differentiate RAL and RLC instruction. (3)

ii) Write an assembly language program for 8085 microprocessor to count even numbers in series of 10 numbers. (10)

Example :



(OR)

b) i) Briefly describe stack pointer register. (3)

ii) Briefly discuss the different types of addressing modes supported by the 8085 microprocessor with examples. (10)

13. a) With a functional block diagram, briefly discuss the architecture of the 8051 microcontroller.

(OR)

b) i) Summarize the similarities and differences between 8085 and 8051. (5)

ii) Discuss in detail the internal data memory organization of 8051 microcontroller. (8)

14. a) i) Interface 8255 with 8085 microprocessor and write an assembly language program to display 99 in Port A, 1's complement of 99 in Port B and 2's complement of 99 in Port C Assume the Port addresses are 30H, 32H and 33H for ports A, B and C respectively. (5)

ii) Describe the operating modes and control words of 8255. (8)

(OR)

b) With a functional block diagram, briefly discuss the architecture of the 8259 programmable interrupt controller.

15. a) Show how to interface a stepper motor to 8051 microcontroller. Also, write an assembly language program to demonstrate control of direction and speed of stepper motor rotation.

(OR)

b) Show how to interface a servo motor to 8051 microcontroller. Also, explain the working principle to control a servo motor with angle rotations.

PART – C **(1×15=15 Marks)**

16. a) Show how to interface a 8 × 8 matrix keyboard to the 8051 microcontroller and discuss in detail the various stages for detection and identification of key activation by a microcontroller. Also, write an assembly language program to detect and identify the pressed key.

(OR)

b) Show how to interface a Digital to Analog Converter (DAC) with 8085 microprocessor and write an assembly language program to generate a square waveform. Also, discuss in detail the successive approximation technique for the process of conversion of analog signal to digital data.