

(3 Hours)

[Total Marks: 80]

Note:-1. Q.1 is compulsory

2. Out of remaining 5 solve any 3 questions
3. Figures to the right indicate full marks

Q.1 Solve any 4

- a. Explain following instructions of 8051 5
 - i) INC @R0 ii) MOVX A, @R1 iii) ACALL address iv) RRC A v) XRL direct, data
- b. A switch is connected to pin P2.0 and an LED to pin P1.7. Write a program to get status of the switch and send it to the LED. 5
- c. What is Thumb2 mode of operation of Cortex M3? State its advantages. 5
- d. Ten 8 bit numbers are stored in internal data memory from location 50H. Write a program to increment the data. 5
- e. Show Interfacing of a dc motor to microcontroller. 5

Q.2 a. Explain various addressing modes of 8051 with examples 10

- b. Assume that the stack pointer points to memory location 3FH and the contents of the memory location 30H, 31H and 32H are 00, 88, and FF respectively. Illustrate the stack contents after the execution of each of the following instructions.

PUSH 30H

PUSH 31H

PUSH 32H

- c. Write an assembly language program to generate a delay of 100 msec. 5

Q.3 a. Write a program to transfer message 'NO' serially with baud rate of 9600 continuously. 10

- b. Explain various timer modes for 8051 10

- Q.4 a. Explain various operating states of Cortex-M3 with thread and handler modes. 10
- b. Explain interfacing of stepper motor to 8051 and write an assembly language program to rotate it in clockwise direction. 10
- Q.5 a. Write an assembly language program for 8051 to display predefined message on LCD. 10
- b. Explain register architecture of Cortex-M3 10
- Q.6 Write short notes on **any 4** 20
- a. NVIC in Cortex-M3
 - b. Interrupts in 8051
 - c. Interfacing ADC to 8051
 - d. Internal memory organization of 8051
 - e. Assembler directives in 8051