

Roll No.

Total Pages : 03

BT-7/M-20

37012

MICROCONTROLLERS

ECE-415-E

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) What is Microcontroller ? Discuss advantages and disadvantages of microcontrollers and its applications in various fields. **10**
- (b) Discuss the criterion for selection of microcontrollers with respect to target product. **10**

2. Discuss in detail different ways of classifying the types of microcontrollers. What are the advantages and disadvantages of microcontrollers in terms of internal bus width, embedded microcontroller, instruction set and memory architecture of bit. **20**

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Unit II

3. (a) Discuss on-chip program memory and RAM address space organization in 8051MC. **10**
- (b) Explain how SP is modified using PUSH and POP instruction. **5**
- (c) Explain the function of each bit of PCON register. **5**

4. (a) Explain the function of each flag bits of PSW registers. What are the applications of carry and overflow flag ? **5**
- (b) Discuss the operating modes of timer and its associated registers. **15**

Unit III

5. (a) Write a program to read the content of the program memory address 50H and copy it into external data memory (RAM) address 50H as well as 100H. **10**
- (b) Write an assembly language program for ADD and AND instructions, the given 8 bit numbers are F5H and 0BH. Write status of flags after execution of program. **10**

6. (a) Write an assembly language program to load the accumulator with the value 55H and complement the ACC 700 times. **5**

- (b) Show the instructions to (i) enable the serial interrupt, timer 0 interrupt, and external hardware interrupt1(EX1), and (ii) disable the timer 0 interrupt and serial interrupt then (iii) show how to disable all the interrupt with a single interrupt ? **9**
- (c) (i) Program the IP register to assign the highest priority to INT1 (external interrupt 1), then (ii) discuss what happens if INT0, INT1 and TF0 are activated at the same time. **6**

Unit IV

7. Discuss the operation, programming and interfacing of multiple interrupt handling with 8051MC. **20**
8. Interface eight LEDs and eight pushbutton switches to port3 and port2 of 8051MC respectively. Write a program to glow LEDs one by one in a sequence continuously. **20**