

Roll No. ....

Total Pages : 03

BT-7/M-20

37132

MICROCONTROLLERS AND EMBEDDED  
SYSTEM DESIGN  
ECE-401N

Time : Three Hours]

[Maximum Marks : 75

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

**Unit I**

1. What is an embedded system ? Explain function of various embedded processors, microprocessors, microcontrollers and coprocessors used in embedded system in detail with suitable examples. **15**
2. Describe the design process of “Smart Card”. What are the software and hardware units required for designing a “Smart Card” ? **15**

## Unit II

3. (a) Explain the function of  $\overline{EA}$ , ALE,  $\overline{PSEN}$ , RST pins. **8**
- (b) Explain, how SP is modified, using PUSH and POP operation with suitable example. **7**
4. Discuss, how timer works. Also explain its operating modes and associated registers. **15**

## Unit III

5. Describe the need and uses of interrupts. Also explain the interrupt execution process along with its associated control registers. **15**
6. (a) Explain, how pipelining works in PIC16C7X microcontrollers with suitable example. **8**
- (b) Find the time delay generated by the following instruction. Assume crystal frequency is 12 MHz.

MOV R0, #20

THERE : MOV R1, #250

HERE : DJNZ R1, HERE

DJNZ R0, THERE **7**

#### Unit IV

7. Describe interfacing of  $16 \times 2$  LCD module with the 8051 and develop a program to display “WELCOME” at the beginning of the first line. **15**
8. Explain the operation, programming and interfacing of DC motor with 8051. **15**

