S.E. (I.T.) Sem IV (R) 16-5-09
Microprocessors & Microcontrollers 3.00 p.m to 6 P

Con. 2573–09. **(REVISED COURSE)** VR–3852

(3 Hours) [Total Marks : 100

N.B. : (1) Question No. **1** is **compulsory**.
(2) Attempt any **four** questions from remaining.
(3) Assume **suitable** address and data if **necessary**.
(4) **Figures** to the **right** indicate **full** marks.

1. (a) Design 8031 based microcontroller system with following details :– 15
   (i) 32 KB Program memory using 27256 chip
   (ii) 32 KB Data memory using 61256 chip
   (iii) 3, 8-bit I/O ports using 8255
   (iv) 8-bit ADC 804.

   (b) Explain the following Instructions :– 5
   (i) XLAT
   (ii) MOVC A, @A +DPTR
   (iii) LEA destⁿ, source
   (iv) SCASW destn
   (v) ACALL address.

2. (a) Write an 8086 Assembly Language Program to generate an square wave of 1 kHz at one of the bit of output port. An 8086 microprocessor is running at 5 MHZ. Show delay calculations. 8

   (b) Write 8086 assembly language program to display 'O' through 'g' and 'A' through 'f' at seven segment display connected at output port OD4H. Assume a delay between two digits. The Codes for 16 digits are stored in data segment. Make use of a procedure for writing program. 12

3. (a) Draw the interfacing diagram for 8086 base system configured in maximum mode with following specifications :– 12
   (i) 8086 working at 5 MHz
   (ii) 16 KB EPROM device
   (iii) 32 KB SRAM device to include IVT. Use full decoding technique. Draw the memory map for above interface.

   (b) What are the conditions that will caues BIU to suspend fetching instructions. Under what condition will the contents of the queue hold the "wrong" op-codes ? 8

4. (a) Write a program that continuously gets 8-bit data from port P_0 and sends it to port P_2 while simultaneously creating a square wave of 1 kHz on port bit P1·5. Use timer 0 to create square wave. Assume XTAL = 11·0592 MHz. 10

   (b) Write 8051 'C' program to transfer "ENGINEER' serially at 9600 baud rate. (8-data bits and 1 stop bit). Do this continuously. 10

5. (a) Give the addressing modes of 8086 microprocessor with suitable examples. 10

   (b) Explain the modes of 8255 PPI which support handshaking (provide necessary timing diagrams) 10

6. (a) 4 x 4 key matrix is to be interfaced to 8051. Show the required interface and write the program to read the pressed key. 10

   (b) Determine the value of register 'Sp' after the following instructions are executed. 5

```
mov SP, Offff H
PUSH f
PUSH C X
CALL DELAY
POP CX.
```

   (c) What is memory segmentation in 8086 ? Explain and give its advantages. 5

7. Write short notes on (any **three**) :–
   (a) Port structure of 8051
   (b) PIC Architecture
   (c) Interrupts of 8086
   (d) Addressing modes of 8051
   (e) Mixed Language Programming for 8086.