(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0109   Roll No. ☐☐☐☐☐☐☐☐☐☐

B.Tech.

(SEMESTER-IV) THEORY EXAMINATION, 2012-13

INTRODUCTION TO MICROPROCESSOR

Time : 3 Hours]   *[Total Marks : 100*

SECTION – A

1.   Attempt **all** parts. $10 \times 2 = 20$

(a)   What is the concept of segmented memory ? What are its advantages ?

(b)   In the op-code fetch cycle, what are the control and status signals asserted by the 8085 to enable the memory buffer.

(c)   If the clock frequency is 5 MHz, how much time is required to execute an instruction of 18 T states ?

(d)   What operation can be performed by using the instruction XRA A ?

(e)   List the different modes of operation of 8255.

(f)   What is the sensor matrix mode of 8279 ?

(g)   What is the difference between 8259 and 8259A ?

(h)   List the advances in 8237 over 8257.

(i)   How does 8086 differentiate between op-code and instruction data ?

(j)   How does 8259A differentiate between an 8-bit and 16-bit processor ?

SECTION – B

2. Attempt any **three** parts. $10 \times 3 = 30$

   (a) Show the timing of how a data byte is transferred from memory to the MPU.

   (b) Draw and explain the read and write cycle timing diagrams of 8086 in minimum mode.

   (c) Illustrate the memory address range of the chip with 256 bytes of memory and explain how the range can be changed by modifying the hardware of the chip select CS'.

   (d) Write a program to add the following data bytes stored in memory locations starting from XX60H and display the sum at the output port if the sum does not generate a carry. If a result generates a carry, stop the addition, and display 01H at the output port.

   Data (H)   First Set : 37, A2, 14, 78, 97

   Second Set : 12, 1B, 39, 42, 07

   (e) How will you provide more than eight interrupt input lines to an 8085 based system ? Explain.

SECTION – C

Attempt **all** parts. $10 \times 5 = 50$

3. Attempt any **one** part.

   (a) Explain the concept of interfacing the 8155 memory segment.

   (b) Write an 8085 assembly program to generate a continuous square-wave with the period of 50 μs. Assume the system clock period is 30 ns and use bit D_1 to output square-wave. Show the delay calculations.

4. Attempt any **one** part.

   (a) Implement, using the 8085 interrupt, program to count continuously in binary with two second delay between each count and write a service routine at XX90H to flash AAH three times when the program is interrupted, with some appropriate delay between each flash.

   (b) List and explain all 8085 vectored interrupts with internal hardware – schematic.

5. Attempt any **one** part.

   (a) Draw the register organization of 8086 and explain typical applications of each register.

   (b) (i) State and explain the different instruction formats of 8086/8088.

   (ii) Explain the addressing modes for control transfer instructions.

6. Attempt any **one** part.

   (a) Write a 20 ms time delay subroutine using register pair BC. Clear the Z flag without affecting any other flags in the flag register and return to the main program.

   (b) Write an 8085 program to count continuously in binary with a one-second delay between each count.

7. Attempt any **one** part.

   (a) Draw and discuss the different modes of operation of 8253.

   (b) Explain the key code format and mode set register of 8279.

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