M.Sc. 2nd Semester Examination, 2012

MICROPROCESSOR BASED SYSTEMS

PAPER— MCA-204

Full Marks : 100

Time : 3 hours

Answer any **five** questions

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

1. (*a*) What is the difference between INX and INR instructions ?

    (*b*) Explain the function of ALE and IO/$\overline{M}$ signals in 8085 microprocessors.

(c) If the 8085 adds 87 H and 79 H, specify the contents of the accumulator and the status of the S, Z and CY flags.

(d) What are the control signals necessary in the memory-mapped I/O ? $3 + 4 + 4 + 3$

2. (a) If the clock frequency is $5 \mu H_3$, how much time is required to execute an instruction of 18 T-states ?

(b) Why the lower-order address bus is multiplexed with data bus ? How they will be demultiplexed ?

(c) What is a microprocesor ? What is the difference between a CPU and a microprocessor ?

(d) What determines that microprocessor is an 8, 16 or 32 bit ? $3 + 5 + 3 + 3$

3. (a) How many memory locations can be addressed by a microprocessor with 14 address lines ?

(b) How many address lines are necessary to address two megabytes (2048 K) of memory ?

(c) Why are the program counter and the stack pointer 16-bit registers ?

(*Continued*)

(d) What is the function of the $\overline{WR}$ signal on the memory chip ?

(e) Specify the number of registers and memory cells in a 128×4 memory chip.

(f) What is the memory word size required in an 8085 system ?

(g) What is the role of internal clock in microprocessor ? 2×7

4. Explain in detail the following instructions and if the clock frequency is 5 MHz then calculate the time required for each instruction. $3\frac{1}{2} \times 4$

   (i)   ADC   M

   (ii) LHLD

   (iii) RLC

   (iv) DI

5. (a) What are the interrupts in microprocessor ? Draw and explain the interrupt structure of 8085 microprocessor.

   (b) What do you mean by vectored interrupt ?

    (c) A number is present in Register B. Set the $D1$ and $D3$ bits of the number with out disturbing the other bits. Restore the number in reg. B. $(2 + 4) + 3 + 5$

6. (a) Write an Assembly Language Programme to separate odd and even numbers from an array of 10 numbers stored from 2050 H. Store the odd numbers from 2060 H and even numbers from 2070 H onwards.

    (b) Two numbers P and Q are stored at 2050 H and 2051 H locations. Logically NAND the numbers and store the result in D register. $7 + 7$

7. Draw a memory interfacing circuit of 8085 to interface two 4 KB EPROM and four 1 KB RAM chips. Give the starting and ending position of each memory chip.   14

[*Internal Assessment* : 30 Marks]