Subject: MICROPROCESSORS & MICROCONTROLLERS

Time: 3 Hours **Max. Marks: 100**

JUNE 2011

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. INTR is a

(A) Hardware interrupt **(B)** Software interrupt
(C) Vectored interrupt **(D)** Nonmaskable interrupt

b. Width of stack pointer in 8085 is

(A) 8 bit **(B)** 16 bit
(C) 4 bit **(D)** Not fixed

c. The no. of address lines required to address 2K memory

(A) 10 **(B)** 11
(C) 12 **(D)** 13

d. Maximum number of devices that can be connected using I/O Mapped I/O addressing are

(A) 128 **(B)** 256
(C) 512 **(D)** 64

e. Address/data bus is demultiplexed using

(A) Ready **(B)** IO/ M′
(C) ALE **(D)** HOLD

f. When MVI A,00H is executed, following flags are affected

(A) Zero **(B)** Carry
(C) Auxiliary Carry **(D)** None

g. In 8255 BSR mode is used to program

(A) Port A **(B)** Port B
(C) Port C **(D)** All ports

h. The maximum number of interrupt an 8259 can serve

(A) 8 **(B)** 10
(C) 16 **(D)** 64

i. IC8251 works with

(A) Synchronous data **(B)** Asynchronous data
(C) Both **(D)** None

j. Maximum addressable memory in 8051 is

(A) 2Mb **(B)** 4Mb
(C) 64 Kb **(D)** 1 Mb

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Explain the function of the following instructions of 8085 with flags affected.
(i) DAA (ii) XTHL
(iii) LDAX Rp (iv) STC **(8)**

b. (i) Address bus is unidirectional. Why? What is denoted by the number of address lines?
(ii) Explain the function of Ready pin in 8085.
(iii)Write the difference between stack and stack pointer.
(iv) Where do auxiliary carry flag is used? **(2×4)**

Q.3 a. Differentiate between Call, JUMP and RST instructions. **(6)**

b. With a neat diagram, explain the architecture of 8085 needed for instruction execution. **(10)**

Q.4 a. A set of 10 readings is stored starting at location 3000h. Write a program in assembly language with proper comments to find the smallest number in the set and store its value in register B and its location in register D & E. **(8)**

b. A set of readings is stored starting at location 5000h. The last byte of the set is 30h. Write a program in assembly language with proper comments to add these bytes. If the sum exceeds FFh, then store 00h at location 50C0h otherwise store the sum. **(8)**

Q.5 a. What happens when RESETIN' pin goes low in 8085? **(4)**

b. What are the functions of SIM and RIM instructions?

c. Draw the block diagram of IC8255 and explain in detail how it works w interrupt driven data transfer scheme. Also, give the details of status word in this mode **(8)**

Q.6 a. Explain the encoded and decoded modes of operation of 8279 for interfacing seven segment display devices to 8085. **(8)**

b. Write an assembly language program with proper comments to implement a decimal counter using logic controller interface. The starting count should be input through the interface and output should be displayed on the interface. **(8)**

Q.7 a. Explain the function of following pins of IC8257.

(i) ADSTB (ii) AEN
(iii) Ready (iv) MARK **(6)**

b. What is the function of 8259? How many initialization command words are used in it? Explain them. **(6)**

c. Give the difference between the master mode and slave mode working of IC8257. **(4)**

Q.8 a. Define synchronous and asynchronous serial transmission. **(4)**

b. Explain the function of transmitter of IC8251, giving details of all the signals used in this section. **(4)**

c. Describe the control word of IC8253 and explain its working in MODE 0 and MODE 3. **(8)**

Q.9 a. Describe the internal RAM organization in IC8051. **(4)**

b. Explain the function of following instructions in IC8051

(i) MUL AB (ii) CLR C
(iii) SWAP A (iv) XCH A,31h **(4)**

c. Write an 8051 assembly language program to modify a given byte at internal RAM location 40H as detailed below, and store the modified byte at internal RAM location 41H.
Bit 0 is to be set to 1;
Bit 2 is to be reset to 0;
Bit 4 is to be complemented;
Bit 6 value should become the same as bit 5;
Bit 7 value should become AND of bit 1 and complement of bit 3. **(8)**