Subject: MICROPROCESSORS & MICROCONTROLLERS

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

DECEMBER 2010

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 half an hour 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. The register in 8085 which is used in addition, subtraction, rotation of data bits and to perform logical operations is called

(A) B **(B)** C
(C) A **(D)** H

b. When we convert (2508) base 10 into a binary number, we get

(A) 100111001100 **(B)** 101110001100
(C) 100011100011 **(D)** 110010011001

c. The flag structure of 8085 is given by

(A) SZXACXPXC **(B)** ZSACXXPXC
(C) ACXZXSXPXC **(D)** CXZXPXCXAC

d. One of the following instructions is a branch transfer instruction

(A) NOP **(B)** JNC
(C) CMP **(D)** XRA A

e. Multiplication in 8085 is performed by

(A) Repeated subtraction **(B)** Comparing two data
(C) repeated addition **(D)** rounding data

f. One of the instruction below is a software interrupt. Identify.

(A) RST 7.5 **(B)** RESET
(C) TRAP **(D)** RST 0

g. Reading and storing two pressed keys (almost simultaneously) is called

(A) Two key lock out **(B)** N key roll over
(C) Key de-bounce **(D)** None of these

h. In a programmable interrupt controller 8259, how many external interrupts can be connected?

(A) 8 **(B)** 16
(C)24 **(D)** 48

i. The terms DTE & DCE are referred to the following interfacing device

(A) 8255 **(B)** 8251
(C) 8279 **(D)** 8253

j. Addition, subtraction, multiplication & division takes place in the following 8051 register(s)

(A) DPTR **(B)** TCON
(C) A & B **(D)** PCON

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

Q.2 a. Explain the architecture of 8085 with the help of a block diagram and explain each block. **(8)**

b. Using logic group of instructions check whether the input byte is a palindrome by writing an assembly language program(ALP) **(8)**

Q.3 a. Interface a 2K RAM and 4K EPROM with 8085 using suitable hardware. **(8)**

b. What is memory mapped I/O and I/O mapped I/O? which is advantageous? **(8)**

Q.4 a. Add two 32 bit/8 digit BCD numbers by writing an Assembly Language Program (ALP) and store the result in memory. **(8)**

b. Write an Assembly Language Program (ALP) to multiply two bytes by shift and add method. Provide appropriate comments. **(8)**

Q.5 a. Explain step by step what happens when an interrupt occurs in a 8085 based System. **(8)**

b. Differentiate hardware and software interrupts. **(8)**

Q.6 a. Explain how 8279 key board/display controller is used to interface I/O with 8085? **(8)**

b. Using 8255 PPI, interface 4 keys and 4 LEDs to 8085 processor. Yo program should read the keys, invert them and then display through the LEDs. **(8)**

Q.7 a. Explain the following terms in connection with 8259 PIC. **(8)**
(i) Call address interval.
(ii) Trigger type.
(iii) End of interrupt.
(iv) Priority modes.

b. What is DMA? Explain the working of a DMA controller with a neat diagram. What is Autoload feature of this interface? **(8)**

Q.8 a. Explain the working of 8253 programmable interval timer with the help of a block diagram and explain the control word. **(8)**

b. Explain pin description of 8251. **(8)**

Q.9 a. Describe the program memory structure of 8051. How do you fetch from internal memory and external memory? **(8)**

b. Exchange the nibble of two data by writing an ALP of 8051. **(8)**