Sixth Semester Examination – 2008

MICROPROCESSOR AND MICROCONTROLLER

Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory
and any **five** from the rest.*

*The figures in the right-hand margin
indicate marks.*

1. Answer the following questions :   2 ×10

   (i) What dedicated operations are assigned to the CX, BX, AX ?

   (ii) For which segment register are the contents of the pointer registers used as an offset ?

   (iii) For which segment register are the contents of the index registers used as an offset ?

   (iv) What is the difference between SI and DI ?

   (v) Show how the double word 12345678H will be stored in memory starting at address A001.

   (vi) If the current values in CS and IP are 0200 and 01AC respectively, what is the address of the next instruction ?

   (vii) What is the purpose of a software model for a microprocessor ?

   (viii) What must an assembly language programmer know about the registers within the 8086 microprocessor ?

   (ix) How much memory can be active at a given time in the 8086 microprocessor?

   (x) What happens to the value in IP each time the 8086 fetches an instruction ?

2. (a) Explain in detail five addressing modes of 8086 with examples.   5

   (b) Explain with example address generation mechanism of 8086 microprocessor.   5

3. (a) Explain in detail Flag register of 8086 with a neat sketch.   5

(b) Differentiate between logical shift and arithmetic shift operation carried out by 8086 instructions, with example.　　5

4. (a) Write an 8085 based Assembly Language Program to calculate the square root of a given number and display it if it is a perfect square, if not display an error message.　　2

(b) What is the purpose of DMA mode of data transfer ? Provide a Schematic diagram of DMA mode of data transfer.　　2

(c) What are the assembler directives in 8086 ? Write their uses (any two).　　2

(d) What is wrong with a MOV CS, AX instruction for 8086 ?　　2

(e) What is the size of the stack pointer in 8051 ? What is the first RAM location of the stack when the 8051 is powered on ?　　2

5. (a) Identify the addressing modes used for the source and the destination operands in the following instructions :　　7

(i) MOV AL,BL

(ii) MOV AX,0FFH

(iii) MOV [DI],AX

(iv) MOV DI,[SI]

(v) MOV [BX]+0400H,CX

(vi) MOV [DI]+0400H,AH

(vii) MOV [BX][DI]+0400H,AL

(b) Given the following sequence of instructions of 8086. What these will cause ?

LEA BX,ARRAY

MOV SI,0

MOV AX,[BX][SI]　　3

6. (a) Draw architecture of 8051 microcontroller and explain in brief.　　5

(b) Explain in detail memory organization of 8051 microcontroller.　　5

7. Write ALP(8086) for the following :　　10

(i) Adding two 16 bit numbers.

(ii) Multiplying two 16 bit numbers.

8. (a) Explain internal architecture of 8086 microprocessor.　　5

(b) Explain the interrupt facility available in 8085 microprocessor.　　5

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