## T.E. (Comp.) (Semester - V) Examination, May 2011
## MICROPROCESSOR AND MICROCONTROLLER

Duration : 3 Hours                 Total Marks : 100

**Instructions :**
1) *Answer any 5 questions by selecting at least 1 from each module.*
2) *Make suitable assumptions if required.*

## MODULE - I

**Q1)** a) Explain the purpose of signals on the following pins of 8086    [3]

     i) HLDA      ii) INTR      iii) Reset

   b) Write a 8086 ALP to search for '*' in string and replace it by '&'.    [5]

   c) Explain the following instructions of 8086 with examples.    [6]

     i) Negate.      ii) CMP.      iii) Lea.

   d) Explain any three addressing modes of 8086 processor with an example each. [6]

**Q2)** a) The contents of registers and memory locations of 8086 system at a given time are given below.

     (DS) = C000H, (DI) = 0002H, (BX) = 0002H, (AX) = 0001H, (SS) = F000H

     (SP) = 0010H, (C0002H) = F9H, (C0003H) = FFH.

     Give the contents of affected registers and memory location after execution of each instruction.    [8]

     i) MOV [DI], BX      ii) IMUL WORD PTR [BX]

     iii) ROR BL, 02      iv) PUSH BX

   b) Give the advantages of using segment registers.    [2]

   c) What is lock prefix? What is its use.    [2]

   d) With a neat block diagram, explain the internal architecture of 8086 Microprocessor.    [8]

## MODULE - II

**Q3)** a) Explain the purpose of signals on the following pins of 8086.    [6]

     i) $\overline{S_0}, \overline{S_1}, \overline{S_2}$      ii) $QS_0$ and $QS_1$      iii) Busy.

   b) Discuss bit definition of Tag word, Control word and status word of 8086.    [10]

   c) Write 8087 ALP to calculate Area of a circle.    [4]

*Q4)* a) Perform the following data conversions with respect to 8087.

     i)    C2CA2000H, a short real format number of 8087 to decimal format.   **[2]**

     ii)    100 to short real format.   **[3]**

     iii)   (23.25) decimal to temporary real format.   **[3]**

   b) Explain the following instructions of 8087 co-processor.   **[8]**

     i)   FSCALE     ii)   FXTRACT     iii)   FXAM      iv)   FSQRT

   c) Give the importance of I/O processors in the microprocessor communication with external devices.   **[4]**

## MODULE - III

*Q5)* a) Explain the internal architecture of 8255 PPI and its port selection logic.   **[8]**

   b) Explain in brief the two methods of interfacing I/O devices.   **[6]**

   c) Explain with neat diagram control word register and status byte of 8254   **[6]**

*Q6)* a) Explain the purpose of signals on the following pins of 8251.   **[8]**

     i)   $\overline{\text{TXC}}$      ii)   $\overline{\text{DSR}}$      iii)   $\overline{\text{CTS}}$      iv) RXRDY

   b) Make control word when the ports of Intel's 8255 are defined as follows.   **[4]**
- Port A as input port in Mode 0.
- Port B as an output port in Mode 0.
- Port $C_{upper}$ $(C_U)$ as an input port.
- Port $C_{lower}$ $(C_L)$ as an output port.

   c) Explain operating Modes of programmable timer (8253).   **[8]**

## MODULE - IV

*Q7)* a) Interface two 4Kx8 EPROMS and two 4Kx8 RAM chips with 8086. Select suitable maps.   **[8]**

   b) Draw and explain the flag register of 80286.   **[6]**

   c) With the help of neat diagram explain interrupt enable register of 8051   **[6]**

*Q8)* a) Explain the following addressing modes of 8051.   **[8]**

     i)   Immediate     ii)   Register     iii)   Direct      iv) Register Indirect.

   b) Draw and explain the internal block diagram of 80286.   **[8]**

   c) Give the salient features of 80486.   **[4]**

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