**Q.P. Code: 29096**

($2\frac{1}{2}$ Hours) **[Total Marks: 60]**

**N.B. :** (1) **All** questions are **compulsory**.

(2) **Figures** to the **right** indicate **full** marks.

(3) Draw **neat** diagrams wherever **necessary**.

(4) Symbols have usual meanings unless otherwise stated.

(5) Use of **non-programmable** calculator is allowed.

**1 a)** Attempt any **one:---** **8**

i) Discuss the interfacing of a keyboard with 8085 microprocessor using 8255 programmable peripheral interface. Explain the key debounce technique using either software or hardware.

ii) Give the account of hardware and software interrupts available in case of 8085 microprocessor.

**b)** Attempt any **one:---** **4**

i) Explain BSR (Bit Set/ Reset) mode in 8255 PPI with the help of suitable example.

ii) Describe a keyboard section of 8279 programmable keyboard/ display interface.

**2 a)** Attempt any **one:---** **8**

i) Explain the READ CYCLE of 8086 in the Minimum mode with the help of timing diagram.

ii) Explain the functions of the following control signals generated by 8288 Bus Controller: I) $\overline{IOWC}$ II) $\overline{MWTC}$ III) $\overline{AIOWC}$ IV) $\overline{AMWC}$

**b)** Attempt any **one:---** **4**

i) Explain the meaning of the following 8086 instructions with suitable examples:

I) CLI II) CLD

ii) Five data words are stored in consecutive memory locations having offset 0500H. Write an assembly language program in 8086 to find the Positive and Negative amongst these data words.

**3 a)** Attempt any **one:---** **8**

i) In the following program a data is transferred serially and also sent out to a port in parallel from 8051 microcontroller. Analyze the program and explain the effect of each instruction in the working of program.

```
        MOV     TMOD,#20H
        MOV     TH1,#-3
        MOV     SCON,#50H
        SETB    TR1
        CLR     RI
RPT:    JNB     RI, RPT
        MOV     A,SBUF
        MOV     P0,A
        MOV     60H,A
        END
```

ii) Describe the use of following registers associated with timer operations in 8051 microcontroller: TMOD register, TH0-TL0 register pair.

**b)** Attempt any **one:---** **4**

i) Describe various interrupts in 8051 microcontroller giving their RAM locations.

ii) Explain the use of timer registers in 8051 microcontroller when a timer has to work as counter.

**4 a)** Attempt any **one:**--- **8**

i) What are the various registers used in CPU of PIC uC? Explain any two registers in detail.

ii) What is prescaling in PIC uC? Explain its necessity with the help of block diagram.

**b)** Attempt any **one:**--- **4**

i) Write a short note on watch-dog timer in PIC uC.

ii) Calculate step size for the following ADCs if Vref=5V.
I)8 Bit II) 12 Bit

**5** Attempt any **four:**--- **12**

**a)** Describe Direct Memory Access technique.

**b)** List any three features of programmable Interrupt Controller 8259.

**c)** Explain in brief the role of BUS / INSTRUCTION QUEUE in 8086.

**d)** What is the Interrupt Vector location of INT 2 and INT 4 in 8086?

**e)** What do you mean by Simplex, Half and Full Duplex transfers? Explain with the help of diagram.

**f)** Assume that after reset, the interrupt priority is set by the instruction - MOV IP,#00001100B. Discuss the sequence in which interrupts are serviced.

**g)** Give an account of Brown out reset of PIC uC.

**h)** State the functions of any four bits of STATUS Register in PIC 16C6X/7X.

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