N.B. : (1) Question No. **1** is **compulsory**.
     (2) Attempt any **four** questions out of the remaining.
     (3) **Figures** to the **right** indicate **full** marks.
     (4) Assume **suitable** data if **necessary** with justification.
     (5) Give **proper** comments to **assembly** language **program**.

1. Design a 8086 based microprocessor system with following specifications :–   20
    (a) 8086 microprocessor working at 5 MHz.
    (b) 8087 co-processor for numeric calculations.
    (c) 64 KB of Monitor program area using 2764 chips.
    (d) 128 KB of application program area using 6225 chips.
    (e) 2 input and 2 output 16–bit ports using 8255 chips in hand-shake mode,
        which should be accessed in fixed-port addressing mode. Explain the design.
        Draw memory map and I/O map. Use absolute decoding technique through
        out the design.

2. (a) Explain the different types of addressing modes in 8086.   10
   (b) Draw timing diagram for :–   10
     (i) Memory Read operation in maximum mode.
     (ii) Interrupt Acknowledge in minimum mode.

3. (a) Draw functional block diagram of 8259 and explain its working.   10
   (b) Draw functional block diagram of 8254 (PIC/T) and explain its working.   10

4. (a) With the help of a neat diagram explain 8086–8087 interface. Highlight the important   10
     signals of the interface.
   (b) Discuss the control and status word format of Numeric processor 8087.   5
   (c) Convert (305.1010) decimal in long real and temporary real format.   5

5. (a) Write a program for 8086 to arrange a string of bytes in ascending order.   10
   (b) What do you mean by multiprocessor system ? What are different, multiprocessor   10
     configuration supported by 8086 ? Draw neat diagrams.

6. (a) Explain the different types of bus arbitration techniques used in multiprocessor systems.   15
   (b) Explain operations of following pins of 8259 :   5
     (i) CAS ϕ –2
     (ii) $\overline{SP} / \overline{EN}$
     (iii) INT.

7. Write short notes on (any **two**) :–   20
    (a) IEEE 488 GPIB
    (b) 8288 Bus Controller
    (c) Interfacing of DRAM to 8086.

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