Con. 2902–07.   (REVISED COURSE)   ND–362

(3 Hours)   [Total Marks : 100

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 an 8086 based microprocessor system with the following specifications :   20
    (a) 8086 microprocessor working at 5 MHz.
    (b) 8087 coprocessor for numeric calculations.
    (c) 32 KB of EPROM using 16 KB devices.
    (d) 128 KB of application program area using 62256 chips.
    (e) 2 input 2 output 16–bit ports using 8255 chips in handshake mode to be addressed
        in fixed port address mode.
Draw the memeory and I/O map. Use absolute decoding technique. Explain the design.

2. (a) With the help of neat diagrams, explain 8086–8087 interface. Highlight the important   10
      signals of the interface.
   (b) Discuss control and status word format of Numeric processor 8087.   5
   (c) Explain the following :   5
        TEST, SAR, FST ST(2), FSTP, XLAT.

3. (a) Explain what is meant by bus arbitration. Mention when it is required. Explain different   10
      types of arbitration schemes.
   (b) Explain with a neat diagram, use of 8289 in multiprocessor systems.   10

4. (a) Write a 8086 program to check if a string initialised in the data segment is palindrome   10
      or not. Clearly specify the comments and state the addressing mode for each instruction.
   (b) Explain the various data formats supported by 8087 coprocessor and convert the   10
      decimal No. $(-67.71875)_{10}$ into short–real format.

5. Differentiate between :   20
    (a) Procedure and macro.
    (b) BIU and EU of 8086 μp
    (c) I/O mapped I/O and memory mapped I/O
    (d) Programmed I/O and interrupt I/O

6. (a) With the hlep of neat block diagram, explain the operation of 8255 in detail. Draw   15
      the timing diagram for the modes available for group A along with BSR mode.
   (b) Write an assembly language program to use 8255 as :   5
      (i) Group A for handshake – I/P mode.
      (ii) Group B for handshake – O/P mode.
    Assume IC is just resulted.

7. Write short notes on any **two** :-   20
   (a) Master-slave configuration of 8259 interfaced with 8086.
   (b) 8254 Programmable Interval Timer.
   (c) Interrupt structure of 8086.
   (d) IEEE 488 GPIB.