BCSE 2ND YEAR 2ND SEMESTER EXAMINATION 2021

MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

Time: 11 AM – 2 PM (06/06/2021) Full Marks: 70

Different parts of the same question must be answered ***TOGETHER.*** *Avoid consultation with others. If* ***similarities*** *found, marks will be deducted.*

Answer any one from the following Q1 and Q2:

1. a) What is addressing mode? Assume that memory (m/m) location 2050_H contains 25_H. Read the content into accumulator (A) using (i) direct addressing mode and (ii) register indirect addressing mode. 2+2+3

   b) Let the instruction MVI A, 15_H is stored from m/m location 2500_H. Write the sequence of steps of fetch cycle and execution cycle to execute the instruction. 5

   c) Write the functions of the (i) MOV A, M (ii) LXI H, 2050_H (iii) LHLD 3000_H and (iv) RAR instructions with proper examples. 2+2+2+2

2. a) Describe the functions of BIU and EU of the 8086 μP using their schematic diagrams. 10

   b) Describe how program execution speeds up in 8086 μP? 5

   c) If the CS register contains 2050_H and IP register contains $3BA2_H$, what is the physical address of the instruction to be fetched? 5

Answer the following Q3:

3. (a) Interface 4K memory as two memory chips (modules) of 2K (M1) and 2K (M2) beginning at address $Y000_H$ using suitable decoders, where 'Y' denotes the last digit of your examination roll number. Explain its address decoding technique and find its RAM address range. Assume/generate appropriate signals and pins. 10+5

   b) What is partial decoding? Explain foldback memory using the data given in Q3. (a). 5+5

Answer any one from the following Q4 – Q5:

4. a) There are N (8-bits) data bytes stored from m/m location 2500_H. The value of N is stored in 2000_H. Write an 8085 program to copy the even and odd integers into the m/m locations starting from 5050_H and 6050_H, respectively. 12

   b) There are N bytes stored from m/m location 2500_H. The value of N is stored in 2400_H. Write an 8085 program to interchange (irrespective of the bit value) the bit D_i with D_j for all bytes. The values of i and j (i, j=0, 1, 2, …, 7) are determined as follows: $i = x$ mod 8 and $j = y$ mod 8, where 'xy' denote the last two digits of your examination roll number. For example, if your exam. roll no. is CSE216025, 'xy' will be '25'. If i=j, use i=7 and j=0. Store the interchanged bytes into the m/m locations starting from 2600_H. 13

5. a) N bytes are stored from m/m location 2500_H. Write a program (with comments) to find the sum of these N bytes after if their i^{th} bit is '1'. The value of i (i=0, 1, 2, …, 7) is determined as follows: $i = y$ mod 8, where 'y' denotes the last digit of your examination roll number. The value of N is stored in 2200_H. Store the result in locations 2300_H and 2301_H. 13

   b) Write a delay subroutine for 1.0 ms in a 2 MHz microcomputer system. 12