

## JADAVPUR UNIVERSITY

B. E. (C.S.E.) 2<sup>ND</sup> YEAR 2<sup>ND</sup> SEMESTER EXAMINATION 2022

## MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

Time: Three Hours

Full Marks: 100

*Different parts of the same question must be answered together*Answer questions Q1 and Q2:

1. a) What is addressing mode? Describe different addressing modes of 8085  $\mu P$  with examples. 2+10  
 b) How many machine cycle and T states are required to execute MVI M, 05<sub>H</sub>? Write the names of these machine cycles. Write the steps and draw the timing diagram of data flow to execute the instruction. Assume that the instruction is stored from 2050<sub>H</sub> 3+4+6
2. (a) Interface 4K RAM chip as two memory chips (modules) of 2K (M1) and 2K (M2) beginning at address 2000<sub>H</sub> using a suitable decoder. 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 2. (a). 5+5

Answer any two from the following questions Q3 – Q6:

3. a) What is an interrupt? What happens when microprocessor receives an interrupt? 5+5  
 b) Name the different types of vectored and non-vectored interrupts? 5  
 c) Describe a scheme with a schematic diagram to resolve multiple interrupts from two or more peripherals simultaneously through INTR line. 10
4. a) A set of  $N$  data bytes is stored in  $m/m$  locations starting from 2501<sub>H</sub>. The value of  $N$  is stored in 2500<sub>H</sub>. Write a program (with comments) to store these data bytes from  $m/m$  location 2600<sub>H</sub> if either  $D_0$  or  $D_7$  is 1; otherwise reject the data byte. 13  
 b) There are  $N$  bytes stored from  $m/m$  location 2500<sub>H</sub>. The value of  $N$  is stored in 2400<sub>H</sub>. Write a program (with comments) to find the sum of these bytes if  $D_4D_3 = 10$ . Store the result in locations 2300<sub>H</sub> and 2301<sub>H</sub>. 12
5. a) There are  $N$  data bytes stored from  $m/m$  location 2500<sub>H</sub>. Write an 8085 program to copy the even and odd integers into the  $m/m$  locations starting from 5050<sub>H</sub> and 6050<sub>H</sub>, respectively. 13  
 b) Write a delay program for 1.0 ms in a 2 MHz microcomputer system. 12
6. a) Describe the functions of BIU and EU of the 8086  $\mu P$  using their schematic diagrams. 10  
 b) Describe how program execution speeds up in 8086  $\mu P$ ? 5  
 c) If the CS register contains 2050<sub>H</sub> and IP register contains ABCD<sub>H</sub>, what is the physical address of the instruction to be fetched? 5  
 d) What are the advantages of segmentation based approach to  $m/m$  accessing in 8086  $\mu P$ . 5