

B. E. (C.S.E.) 2ND YEAR 2ND SEMESTER EXAMINATION 2023
MICROPROCESSOR AND ASSEMBLY LANGUAGE PROGRAMMING

Time: Three Hours

Full Marks: 100

*If you answer more questions from a section, only first legitimate answer(s) will be evaluated. Different parts of the same question must be answered **together***

Answer any one from question 1 (CO1) and 2:

1. (a) Describe the functions of different units of a generic computer system with the help of a schematic diagram. 10
- (b) Describe the functions of BIU and EU of the 8086 μP using their schematic diagrams. 10
- (c) If the CS register contains 2550_H and IP register contains $ABCD_H$, what is the physical address of the instruction to be fetched? 5

2. (CO6) (a) Describe the sequence of steps required for data transfer between microprocessor and an I/O device with appropriate schematic diagram. 10
- (CO6) (b) Write the sequence of steps for DMA operation. 5
- (CO3) (c) Write the steps and draw the timing diagram of data flow to execute the instruction, LDA 2050_H . Assume that the instruction is stored from 2000_H . 10

Answer any two from questions 3–5 (CO2):

3. (a) There are N bytes stored from m/m location 2500_H . The value of N is stored in 2400_H . Write an 8085 program (with comments) to interchange the bit D_7 with D_0 (irrespective of their values) of these bytes and store them into the m/m locations starting from 5050_H . 13
- (b) Write a program (with comments) to find the sum of even bytes out of N bytes stored in consecutive locations starting from 2500_H . The value of N is stored in 2200_H . Store the result in locations 2300_H and 2301_H . 12

4. (a) A set of N data bytes is stored in m/m locations starting from 2501_H . The value of N is stored in 2500_H . Write a program (with comments) to store these data bytes from m/m location 2600_H if either D_4 or D_3 is 1; otherwise reject the data byte. 13
- (b) There are N bytes stored from m/m location 2500_H . The value of N is stored in 2400_H . Write a program (with comments) to find the sum of these bytes if $D_3D_2 = 11$. Store the result in locations 2300_H and 2301_H . 12

5. (a) There are N 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. 13

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

Answer any one from question 6 (CO4) and 7 (CO5):

6. (a) Interface 3K RAM chip as two memory chips (modules) of 1K (M1) and 2K (M2) beginning at address 2000_H 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 6 (a). 5+5
7. (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