

Assignment- 1

Subject: Microprocessor and Microcontroller Interfacing

Class: B. E. Semester V

		Marks
Q-1	What is a microprocessor? List its internal sections with the major functions.	02
Q-2	What is system bus? Give its role.	02
Q-3	What are the control signals? How do we generate them? Give their importance.	04
Q-4	Why does opcode fetch cycle need 4-T states although it is similar to memory read cycle?	02
Q-5	Compare memory mapped I/O and peripheral mapped I/O.	04
Q-6	How many machine cycles are required to execute LDA 3050h instruction? Draw complete timing diagram with each machine cycle and briefly explain it.	07
Q-7	For each pin (line) shown below state whether it is an input pin or output pin and mention its function. a) ALE b) READY c) X1 and X2 d) CLKOUT e) SID f) TRAP g) INTR h) HOLD	02 per pin
Q-8	Write an 8085 program to count the number of odd numbers in a block of five numbers. Number is odd, if it's LSB = 1. Store your answer in ACC.	07
Q-9	Write an 8085 program to copy block of ten numbers starting from location 2050h to locations starting from 3050h.	07
Q-10	What is meant by Bus? Why is the address bus unidirectional and the data bus bidirectional?	01

- Q-11 Write an 8085 program to reverse a string stored as series of ASCII characters starting from location 3050h and ended with 0Dh using stack. 07
- Q-12 Write an 8085 subroutine to exchange two numbers. Use it to reverse an array of 10 numbers starting from 3050h. 07
- Q-13 The memory address of the last location of a 1 K byte memory chip is given as FBFF H. Specify the memory map. 01
- Q-14 Explain the following instructions of 8085. Also mention about the addressing mode and flags the instruction affects. 02 per instruction
- | | |
|---------------|---------|
| a) LHLD 1000H | h) RIM |
| b) RAL | i) XCHG |
| c) DAD D | j) XTHL |
| d) PUSH PSW | k) PCHL |
| e) PCHL | l) STC |
| f) CMA | m) RRC |
| g) RET | |
- Q-15 What do you understand by the term Addressing mode? Explain the Addressing modes supported by 8085 by giving suitable examples. 07
- Q-16 Design a memory system that contains 2K byte of EPROM, immediately followed by 1K byte of RWM. The EPROM starts at address 0000H and it is implemented by using 1K byte of EPROM .The RWM is implemented using 1K byte RAM chips. Use decoder and gates (if required) for the interfacing circuit. 07
- Q-17 In instruction requires 3 machine cycles and 10 T states for the execution. Explain using timing diagram, sequence of events taking place in each machine cycle with reference. 07
- 3000HIN 05H instruction.
- Q-18 An array of binary numbers is stored in memory starting from address 3000H. There are ten numbers in the array. Write an ALP which finds out quantity of positive numbers , negative numbers and zeros in the data array and stores the result in memory location starting from address 3050H. 07
- Q-19 Explain Memory Mapped I/O and Peripheral I/O and make the comparison between them. 07

- Q-20** Write an ALP to multiply the contents of memory location 3040H by the contents of memory location 3041H and store the result in memory locations 3042H and 3043H with LS byte of the product at memory location 3042H. Draw also the flow chart. **07**
- Q-21** Explain the function of RIM and SIM instructions. **07**
- Q-22** Write a detailed note on Memory Classification.
- Q-23** Explain clearly the interrupt arrangement in 8085 microprocessor with appropriate diagram. How the interrupts are activated? To which memory location an interrupt points? How the priority is arranged? How the interrupts can be cleared? **07**
- Q-24** Draw the functional block diagram of internal architecture of IC 8085 and explain its working. **07**
- Q-25** Explain the execution of the instruction STA 2050H with neat timing diagram. **07**
- Q-26** Write a program to multiply two unsigned numbers stored in register pair H and L, save the result. **07**
- Q-27** Answer following questions: **07**
- a) How many address lines are necessary on the chip of 2K byte memory?
 - b) If the memory chip size is 1024 X 4 bits, how many chips are required to make up 2K bytes of memory?
 - c) The memory map of a 4K byte memory chip begins at the location 2000 H. Specify the address of the last location on the chip and the number of pages on the chip.
 - d) The memory address of the last location of an 8K byte memory chip is FFFF H. Find the starting address.
- Q-28** Given the components as listed; design an interfacing circuit for the memory to meet the following specifications: **07**
- a) 74LS138: 3-to-8 decoder
 - b) 2732 (4K X 8): EPROM—address range should begin at 0000 H.
 - c) 6116 (2K X 8): CMOS R/W memory.
- Q-29** Write a detailed note on Interrupts of 8085. **07**
- Q-30** List and Explain categories of 8085 instructions that manipulate data. **07**
- Q-31** Using diagram illustrate logic pin out of the 8085 Microprocessor. **07**

Q-32	Explain the timing diagram of the memory write cycle	07
Q-33	Illustrate the steps and the timing of data flow when the instruction code 01001111 (4FH – MOV C,A), stored in location 2005H, is being fetched.	07
Q-34	Explain (i) ALU (ii) Program counter (iii) Instruction decoder	03
Q-35	Explain addressing modes of 8085 microprocessor with example	04
Q-36	Design a memory interfacing circuit for a given 4k ROM chip. Use all 16 address line. Use any combination of inverter, NAND gate and 74LS138 decoder to generate the address. Determine the memory map of the design.	07
Q-37	Draw and explain the timing diagram of instruction MVI A,32H. Find execution time required, if clock frequency is 2MHz.	07
Q-38	Draw and explain timing diagram of OUT 01H	07
Q-39	Draw and explain timing diagram of IN 01H	07
Q-40	Define the following:	03
	a) T-state	
	b) Instruction Cycle	
	c) Machine Cycle	