Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV • EXAMINATION – SUMMER-- 2015

Subject Code:140701 **Date: 28/05/2015**

Subject Name: Microprocessor and Interfacing

Time: 10.30am-01.00pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Draw the internal architectural block diagram of 8085 microprocessor and explain each block and working of 8085 in detail. **07**

(b) State the functions of the following instruction. **07**

1) PUSH PSW 2) XCHG 3) PCHL 4) XTHL
5) SIM 6) DAA 7) LHLD

Q.2 **(a)** Answer following questions. **07**

1) The memory address of the last location of a 1K byte memory chip is given as FBFFH. Specify the starting address.
2) How many bits are stored by a 256 x 4 memory chip? Can this chip be specified as 128-byte memory?
3) Why program counter and stack pointer is a 16 bit register?
4) If the memory chip size is 1024 x 4 bits, how many chips are required to make up 2K bytes of memory?
5) Why the number of output ports in I/O mapped I/O is restricted to 256 ports? In I/O mapped I/O, the input and output ports can have the same 8-bit address than how does the microprocessor differentiate between the input and output ports?
6) What operations can be performed by using the instructions…
   a) ADD A b) XRA A
7) Explain why a latch is used for output port but a tri state buffer can be used for an input port.

(b) Draw the timing diagram for the instruction STA 3050 H and explain in detail. If the processor clock is 3 MHz calculate the time required to execute the instruction. **07**

OR

(b) Define T-state, machine cycle and instruction cycle. Draw the timing diagram for the instruction IN AA h. **07**

Q.3 **(a)** A data array of length 16 (Decimal) has been stored in the memory address starting from 3000H. Write an ALP to arrange the data in ascending order as well as in descending order and store the result in the memory location starting from 2000H and 2050H respectively. **07**

(b) Write a program for 8085 to generate a square wave with period of 400μs. Use bit D0 to output the square wave. The system clock period is 325ns. **07**

OR

Q.3	**(a)**	What is interrupt? What are the interrupts available in 8085 microprocessor? Write interrupt vector table for vectored interrupts. Explain SIM and RIM instructions.	**07**
	(b)	Write an ALP to count from 00 to 20H with a delay of 100 ms. between each count. After the count 20H, the counter should reset itself and repeat the sequence. Use register pair DE as a delay register. Draw a flowchart and show your approximate delay calculations for 100ms delay. The clock freq. is 1Mhz. Assume suitable value of T states for the delay calculation.	**07**
Q.4	**(a)**	Draw the diagram for interfacing 8KB of ROM and 8KB of RAM with microprocessor 8085 and also explain the number of pins used for such interfacing. The starting address for ROM should be 0000H and starting address for RAM should be 8000H.	**07**
	(b)	What do you understand by the term Addressing Modes? Explain, giving suitable example, all the addressing modes supported by 8085.	**07**
		OR	
Q.4	**(a)**	Interface 8K EPROM and 4K RAM with 8085 processor. Write address range for both the memory chips and also show the address decoding logic	**07**
	(b)	Discuss memory mapped I/O and I/O mapped I/O in detail.	**07**
Q.5	**(a)**	Draw the internal block diagram of IC 8255 and explain function of each block in detail.	**07**
	(b)	Explain with neat diagram the programmable timer/counter IC.	**07**
		OR	
Q.5	**(a)**	Write a short note on IC 8251 (USART).	**07**
	(b)	Discuss in detail the interrupt controller IC.	**07**

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