Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV(OLD) • EXAMINATION – WINTER 2016

Subject Code:140701 Date:19/11/2016

Subject Name:Microprocessor And Interfacing

Time:02:30 PM to 05:00 PM 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)** Answer the following questions: (3+2+2 Marks) **07**

1. Describe the operation of the following instructions of 8085 with example.
   (i) DI (ii) LHLD (iii) SPHL
2. Write the addressing mode for the following instructions of 8085.
   (i) JMP 2070 (ii) STAX B (iii) LDA 3000 (iv) ADD M
3. Compare assembly level language with high-level language.

(b) Answer the following questions: **07**

1. If the memory chip size is 2048 X 4 bits, how many chips are required to make up 16K bytes of memory?
2. Why are the program counter and the stack pointer 16-bit registers?
3. Draw the format for flag register in 8085 microprocessor.
4. The memory map of memory chip begins at the location C000H and ends at location FFFFH. How many address lines are necessary for the chip?
5. Specify the crystal frequency required for an 8085 system to operate at 1.1MHz
6. How many times the following loop will be executed.

```
        LXI B,0007H
LOOP: DCX B
        JNZ LOOP
```

7. Write any two 1-byte instructions to load 00H into register A.

Q.2 **(a)** What is difference between absolute decoding and partial decoding? Design an interfacing circuit for the memory system to meet the following specifications: (Use 3-to-8 decoder for interfacing circuit) **07**

1. 1K byte R/W memory- address range should begin at 8000 H.
2. 8K byte ROM1- address range should begin at 0000 H.
3. 8K byte ROM2- address range should begin at E000 H.

(b) Explain 8085 bus organization in detail and answer the following questions: **07**

1. Why data bus is bidirectional while address bus is unidirectional?
2. Explain with a sketch how demultiplexing of AD_7-AD_0 bus takes place.

OR

(b) Answer the following questions: **07**

1. Distinguish between memory mapped I/O and peripheral mapped I/O.
2. Identify the control signal for the fourth machine cycle of the instruction STA 8000 and explain fourth machine cycle with neat timing diagram.

Q.3 **(a)** Draw the circuit for generating Read/Write control signals for memory and I/O. Also explain the function of the following pins of 8085 microprocessor. **07**

(i) READY (ii) S_1 and S_0 (iii) HLDA (iv) RESET OUT

(b) For instruction IN 05H explain sequence of events taking place in each machine cycle using timing diagram. For illustration consider instruction is stored in memory locations 2070H and 2071H. **07**

OR

Q.3 **(a)** Discuss the use of stack for subroutine. Explain stack operations in 8085 microprocessor using PUSH and POP instructions. Compare it with CALL& RET instructions. **07**

(b) What are the vectored interrupts? Distinguish between the hardware & software interrupts and explain SIM instruction in detail. **07**

Q.4 **(a)** A set of five readings is stored in memory starting at 2070H. Write a program to sort the readings in ascending order. (Assume suitable data) **07**

(b) Answer the following questions: (5+2 Marks) **07**

1. A string of six data bytes is stored starting from memory locations 2050H. The string includes some blanks (bytes with zero value). Write a program to eliminate the blanks from the string.
2. Specify the contents of flags Z and CY as the following instructions are executed.
   SUB A
   DCR A
   INR A
   SUI 01H

OR

Q.4 **(a)** A binary number is stored in memory location 2050H. Write a program to convert the number into BCD, and store each BCD as two unpacked BCD digits in the output buffer. (Assume suitable data) **07**

(b) Answer the following questions: (5+2 Marks) **07**

1. Write a program to generate a square wave with period of 400μs. Use bit D_7 to output the square wave. (Assume system clock period is 325ns)
2. Specify the contents of accumulator and flag CY when the following instructions are executed.
   MVI A, C5H
   ORA A
   RAL
   RRC

Q.5 **(a)** Write note on 8279 programmable keyboard/display interface. **07**

(b) With the help of simplified block diagram explain the internal architecture of IC 8255A and answer the following questions. **07**

1. Draw the control word for BSR mode.
2. Specify the handshake signals if port A is set up as an output port in mode 1.

OR

Q.5 **(a)** Describe the block diagram of 8259A programmable interrupt controller and explain 8259A interrupt operation in the simplest format. **07**

(b) Answer the following questions: (4+3 Marks) **07**

1. Explain any two working modes of IC 8254-Programmable interval timer.
2. Explain importance of DMA.

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