

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-V(New) • EXAMINATION – WINTER 2016

Subject code: 2150707

Date:19/11/2016

Subject Name: Microprocessor and Interfacing

Time:10:30 AM to 01:00 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

Answer the following questions:

- i. Differentiate between assembly level language and machine level language. **01**
- ii. How many distinct instruction codes can be generated by an 8085 microprocessor? Why? **01**
- iii. State the importance of X_1 and X_2 pins of an 8085 microprocessor. **01**
- iv. What is an interrupt? Enlist the hardware interrupt sources (pins) available on the 8085 microprocessor chip. **01**
- v. State the uses of program counter and stack pointer registers of an 8085 microprocessor. **01**
- vi. How many flags are available in an 8085 microprocessor? State the importance of an auxiliary carry (AC) flag. **01**
- vii. How much time an 8085 microprocessor will take to execute the **LXI B, 4000H** instruction, if the crystal frequency is 4MHz? **01**
- viii. Explain the **PCHL** instruction of an 8085 microprocessor with example. **01**
- ix. Write a set of 8085 assembly language instructions to unpack the upper nibble of a BCD number. **01**
- x. Explain the use of READY pin of an 8085 microprocessor. **01**
- xi. Enlist various segment registers available in an 8086 microprocessor. **01**
- xii. Draw the format of a flag register of an 8086 microprocessor. **01**
- xiii. State various types of registers available in programmable interrupt controller (8259). **01**
- xiv. What will be the physical address (PA), if CS and IP register contents of an 8086 microprocessor are 2500h and 0002h, respectively? **01**

Q.2 (a)

Define the terms: T-state, Machine cycle. How many machine cycles and t-states will be required to execute the **LHLD** instruction? **03**

(b) Draw the timing diagram of **MOV M, B** instruction of an 8085 microprocessor. **04**

(c) An array of ten data bytes is stored on memory locations 2100H onwards. Write an 8085 assembly language program to find the bytes having complemented nibbles (e.g. 2DH, 3CH, 78H etc.) and store them on a new array starting from memory locations 2200H onwards. **07**

OR

- (c) An array of twenty data bytes is stored on memory locations 4100H onwards. Write an 8085 assembly language program to remove the duplicate entries from the array and store the compressed array on a new array starting from memory locations 4200H onwards. 07
- Q.3** (a) Draw the interfacing of a 2K EPROM having an ending address 0FFFH with 8085 microprocessor. Use demultiplexed address/data lines and 3-to-8 decoder (74LS138). 03
- (b) Write a set of 8085 assembly language instructions to generate a 1 second delay, if the crystal frequency is 6 MHz. 04
- (c) Write an 8085 assembly language program to count the number of bytes that are greater than 25_{10} and lesser than 65_{10} from an array of twenty bytes stored on memory locations 2000H onwards. Store such numbers on memory locations 2100H onwards. 07

OR

- Q.3** (a) Describe various addressing modes of 8085 microprocessor with examples. 03
- (b) Show all the necessary connections to interface eight LEDs using an output port with address 45H with 8085 microprocessor. Use demultiplexed address/data lines and 3-to-8 decoder (74LS138). 04
- (c) Write an 8085 assembly language program to count the positive numbers, negative numbers, zeros and to find the maximum number from an array of twenty bytes stored on memory locations 2000H onwards. Store these three counts and the maximum number on memory locations 3001H to 3004H, respectively. 07
- Q.4** (a) Differentiate between the hardware and software interrupts. How many such interrupts are available in 8085 microprocessor? 03
- (b) Define the concepts of stack and subroutine. Explain the PUSH and POP instructions of an 8085 microprocessor with example. 04
- (c) What is the need of the programmable interrupt controller (8259A)? Draw and explain the block diagram of 8259A. 07

OR

- Q.4** (a) State the difference between vectored and non-vectored interrupts. Explain vectored interrupts of 8085 microprocessor. 03
- (b) Explain the **SIM** and **RIM** instructions of an 8085 microprocessor. 04
- (c) With necessary diagrams, explain mode 1 of the programmable peripheral interface (8255A) with necessary diagrams. 07
- Q.5** (a) Describe the importance of bus interface unit (BIU) and execution unit (EU) an 8086 microprocessor. 03
- (b) Differentiate between the real mode and protected mode of an 80286 microprocessor. 04
- (c) Explain the paging mechanism in an 80386 microprocessor. 07

OR

- Q.5** (a) Explain the following pins of an 8086 microprocessor: $\overline{BHE}$, $\overline{RQ}/\overline{GT0}$ 03
- (b) Explain, in brief, various addressing modes of an 80286 microprocessor. 04
- (c) Explain the major architectural features of a SUN SPARC processor. 07
