

**B. Tech.**  
**(SEM IV) THEORY EXAMINATION 2017-18**  
**INTRODUCTION TO MICROPROCESSORS**

Time: 3 Hours

Total Marks: 70

**Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.

**SECTION A**

**1. Attempt all questions in brief. 2 x 7 = 14**

- a) Describe the logic devices for interfacing.
- b) Describe the function of ALE signal.
- c) Explain the programming techniques of Looping and Counting.
- d) Explain the difference between RLC and RAL.
- e) What is a subroutine? Explain the concept of multiple calling for a subroutine.
- f) List the various modes of 8254/ 8253 programmable interval timer IC.
- g) Explain the function of DMA controller.

**SECTION B**

**2. Attempt any three of the following: 7 x 3 = 21**

- a) Draw the block diagram of 8085 microprocessor and explain its various blocks and signals. Explain the programming model of 8085. Explain the flag register bits.
- b) Describe the concept interfacing input and output devices with 8085 microprocessor by interfacing 8-DIP switches as input devices and Seven-segment LED display as output device to 8085.
- c) Describe the various Interrupts of 8085 microprocessor. What are vectored interrupts? Describe the vector address of 8085 interrupts.
- d) Explain the concept of BCD addition using a suitable example. Write a assembly level program for the addition of two unsigned BCD numbers.
- e) Explain the function of Programmable peripheral interface IC 8255 with the help of a block diagram. Describe the Ports of IC8255 with their available modes of operation.

**SECTION C**

**3. Attempt any one part of the following: 7 x 1 = 7**

- (a) Explain how the op-code is fetched from the memory. Explain the op-code fetch cycle with the help of a timing diagram
- (b) Differentiate between absolute decoding and partial decoding schemes of address decoding. Design a scheme to generate Read/Write control signals for memory and I/O from microprocessor signals IO/M', RD', WR'.

**4. Attempt any one part of the following: 7 x 1 = 7**

- (a) (i) The memory location 2050H holds the data byte F7h. Write instructions to transfer the data byte to the accumulator using three different opcodes: MOV, LDAX, and LDA.
- (ii) Explain the various addressing modes of 8085 with suitable examples.

- (b) Classify the instruction set of 8085 on the basis of their functions. Write the different instructions and explain their function.

**5. Attempt any *one* part of the following:** **7 x 1 = 7**

- (a) Draw the flowchart and write a program and for a zero-to-nine (module ten) counter.  
(b) Explain the concept of stack memory and stack pointer. Describe the various conditional call and conditional return instructions.

**6. Attempt any *one* part of the following:** **7 x 1 = 7**

- (a) A multiplicand is stored in memory location 2050H and a multiplier is stored in the location 2051H. Write a main program to transfer the two numbers from memory locations to the HL registers and store the product in the output buffer at 2090H. Write a subroutine to multiply two unsigned numbers placed in registers H and L and return the result in to the HL pair  
(b) (i) Explain the function of instructions: XCHG, XTHL, SHLD, and SPHL.  
(ii) Registers BC contain 8538H and registers DE contain 62A5H. Write instructions to subtract the contents of DE from the contents of BC and place the result in BC.

**7. Attempt any *one* part of the following:** **7 x 1 = 7**

- (a) Describe the block diagram of 8259A programmable interrupt controller and explain each block. Describe the priority modes of the 8259.  
(b) Describe the function of BIU and EU in the architecture of 8086 microprocessor. Explain the Register organization of 8086 microprocessor. Explain the function of signals: TEST', LOCK'.