Student Exam No: _____

GANPAT UNIVERSITY

B.TECH SEM. V - MECHATRONICS ENGINEERING

REGULAR EXAMINATION NOV/DEC - 2013

2MC505 MICROPROCESSOR

Time: 3 Hours **Total Marks: 70**

Instructions:

1). All questions are **compulsory**.
2). Figures to the **right** indicate full marks.
3). Answers to the two sections must be written in **separate** answer books.
4). Assume all necessary data.

Section - I

Que:-1 Attempt All. **[12]**

(A) Describe Machine language and Assembly language.
(B) List the four operations commonly performed by the 8085 and explain Bus architecture.
(C) (i) If the memory chip size is 256 x 4 bits, how many chips are required to make up 8K bytes of memory?
(ii) What is the difference between compiler and interpreter?

OR

Que:-1 Attempt All. **[12]**

(A) Explain the 8085 vectored interrupts.
(B) Define Microprocessor, T-state, Word and Instruction.
(C) "The number of bytes of the instruction is not equal to the number of machine cycles of the instruction" – justify this statement by giving example.

Que:-2 (A) Explain LDA instruction with timing diagram. **[06]**
(B) Design an interfacing circuit for memory to meet the following specification. Also write address ranges of both chips after interfacing. **[05]**
(i) 3 to 8 decoder
(ii) 4K ROM address range should begin at 8000H and additional 4K memory space should be available for future expansion.
(iii) 2K RAM

OR

Que:-2 (A) Design a circuit to interface 2 seven-segment LEDs at output port with the device address 88H and FFH, using a 3-to-8 decoder, a 4-input NAND gate, a NOR gate, and a common anode seven-segment LED. Write instruction to display FA at the port. **[06]**
(B) Draw the timing diagram for IN 22H. **[05]**

Que:-3 Attempt All. **[12]**

(A) What is difference between the program counter and stack pointer?
(B) Write short note on EPROM and EEPROM.
(C) Explain the basic block diagram of Microprocessor.

Section - II

Que:-4 Attempt All. [12]

(A) Six bytes are stored from memory location starting from 2051H. Write an ALP to add all the data bytes. Use register D to save the carries generated, while adding the entire data bytes. Display the entire sum at two consecutive memory locations 3070H and 3071H.

(B) Write an ALP to arrange the following three sets of data in descending order. C151H=23H, C152H=56H and C153H=42H.

(C) Write instructions to clear carry flag, to load number FFH in register C, and to add 01 to C. If the CY flag is set, display 01 at the output port 00H; otherwise, display the contents of the register C. Explain your results.

OR

Que:-4 Attempt All. [12]

(A) A set of 25 readings are stored from memory location starting from C060H. Add all the positive readings and reject all the negative readings. When the sum exceeds eight bits then display FFH at PORT1, otherwise display the original sum.

(B) Calculate the sum of series of even numbers from the list of numbers. The length of the list is D200H=05H and the series starts from C100H. Store the sum of series in 3151H and carries generated in 3152H.

(C) Load the data byte 8EH in register B and F7H in register C. Mask the higher order bits (D7-D4) from both the data bytes and perform Exclusive OR without using the XRA instruction and display the answer at D350H memory location.

Que:-5 Attempt All.

(A) Write a program to turn On and Off the light every 3 seconds continuously. Use data bit D2 to operate the light and choose any frequency and show calculation for count. [04]

(B) Write an ALP to find out the square root of the given number in C100H and store the result in C200H location. [04]

(C) Write an ALP to make decimal counter of single digit and display the count on port A of 8255. Take 25ms delay between each count. Use counter 0 of 8254 to display the count and counter 1 of 8254 for count. [03]

OR

Que:-5 Attempt All.

(A) Write an increment and decrement counter which counts from 0 to 2010 and 2010 to 0 continuously. The time between each count is 1.5second. Take f=1MHz. [04]

(B) Write an ALP to load one number in the reg. B and compare with the Reg. A. Store the result in the Reg. C as per the following conditions. [04]

i.. A < B C = 01H
ii. A = B C = 00H
iii. A > B C = 02H

(C) Generate a rectangular wave of 75ms ON delay and 25ms OFF delay on bit 2 of port C of 8255. Use frequency f=2kHz. [03]

Que:-6 Attempt All.

(A) [02]

	A	S	Z	CY
MVI A,7FH				
ORA A				
CPI A2H				

(B) A string of six bytes is stored starting from memory location C000H. Write an ALP to Transfer these data in reverse order from memory location C100H. [02]

(C) Write an ALP to find out number of 1's and 0's present in a 8-bit number stored in C050H. Store the result for 1's in C150H and 0's in C151H. [04]

(D) [04]

a) A set of five bytes is stored from memory location starting from C101H to C105H. Write a program to interchange the lower nibble and higher nibble then store on C201H to C205H.(Example 39H then store 93H)

b) Write an ALP to find out the cube of a given number stored in location C121H. Store the answer in C122H.

END OF PAPER