Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Semester: IV Electronics & Communication Engineering

CBCS Regular Examination April - June 2015

2EC404 Microprocessor Architecture and Programming

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

Instructions: 1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

Section-I

Que.-1 **(A)** Draw and explain 8085 Bus structure with example of memory read operation. 6

(B) Write a program to generate a continuous square wave with the period of 400μs. Assume the system clock frequency is 2 MHz and use bit D0 of port0 to output the square wave. (MVI Rd, 8-bit data – 7 T states, DCR Reg. – 4 T states, JNZ Label – 10/7 T states). 6

OR

Que.-1 **(A)** Give classification of Memory and explain each in brief. 6

(B) Six bytes of data are stored in memory locations starting at D050H. Add all the data bytes. Use register B to save any carries generated, while adding the data bytes. Store the entire sum at two consecutive memory locations, D070H and D071H. 4

(C) Classify the 8085 interrupts. 2

Que.-2 **(A)** Explain the generation of Memory Read/Write and I/O Read/Write control signals with the help of necessary sketch. 6

(B) An 8 bit binary number 7D h is stored in memory location D060 h. Write a program to convert this binary number to ASCII code and store the codes in memory locations E000 h and E001 h.(The hexadecimal numbers 30 h to 39 h represent 0 to 9 decimal numbers and 41 h to 5A h represent A through Z). 5

OR

Que.-2 **(A)** Illustrate the steps and timing of data flow when the instruction code 0100 1111=4F h (for MOV C, A instruction) stored in location 2005 h, is being fetched. 6

(B) Give detail of output after execution of following instructions: (Memory location 2050 h contains binary data F7 h) 5

1. LXI H, 2050 h
   MOV A,M
2. LDA 2050 h
3. LXI B,2050 h
   LDAX B
4. MVI A, AA h
   RLC
   RAL
   RAR
5. LXI H, 2050 h
   INR M

Que.-3 (A) The memory address of the last location of a 2K byte memory chip is given as FBFF h. Specify the starting address. 2

(B) Specify the four control signals commonly used by the 8085. 2

(C) Store two numbers 9A h and B7 h in memory locations C200 h and C201 h. Add these two numbers and store the answer in memory locations C202 h and C203 h. 4

(D) Load 9B h in register A and 6C h in register B and perform the EX-OR operation with the numbers stored in register A and B and store result in memory location C200 h. (Use only AND, OR and Complement operation). 4

Section-II

Que.-4 (A) Accumulator holds the data byte AB h. Write instructions to transfer the data byte of A to the memory location E500 h using three different opcodes: (1) MOV M, A (2) STAX B/D reg. pair (3) STA 16 bit address. Illustrates them with the help of block diagrams. 6

(B) Draw and explain block diagram and control word of 8155 programmable I/O ports and timer. 6

OR

Que.-4 (A) Explain the data transfer during the execution of the CALL instruction with necessary sketch and example. 6

(B) Draw and explain block diagram and control word of 8255 programmable I/O ports. 6

Que.-5 (A) Draw the timing diagram for execution of IN instruction. 6

(B) Write an ALP to load one number into B register and compare it with the content of A register. If A>B store 01 h in register C, If A=B store 00 h in register C. If A<B store 02 h in register C. 5

OR

Que.-5 (A) Draw the timing diagram for execution of STA 8000 h instruction. 6

(B) Find the positive and negative numbers in an array of 10 elements. Assume array starting from C050 h onwards. Store the result of number of positive numbers in D050 h and number of negative numbers in D051 h. 5
Data(H): 37, A2, F2, 82, 57, 5A, 7F, DA, E5, 8B

Que.-6 (A) Explain the 3-to-8 line decoder with logic symbol and functional table. 3

(B) Explain each bit of SIM instruction in brief. 2

(C) Draw the circuit to implement instruction RST6 (F7 h) for 8085. 3

(D) Write an ALP to find out 1's and 0's present in the EA h number. 4

END OF PAPER