IC1515

M.Sc. (INFORMATICS)/I Sem – 2015
Paper IT-15 – MICROPROCESSOR AND INTERFACE PROGRAMMING

Time: 3 hrs. ***Attempt five questions in all*** **Max Marks: 75**

Question No. 1 is compulsory

(Write your Roll No. on the top immediately on receipt of this question paper)

1. Attempt any five :
   (a) Write an appropriate AND instruction to preserve bits 0, 3, 9 and 13 of register BX, and clear all others.
   (b) What instructions are necessary to determine the largest number contained in BX, CX and DX? The number should be placed in AX when found.
   (c) Data are to be read in from two byte wide input ports AAH and A9H and then output as a word to a word wide output port at address B000H. Write a sequence of instructions to perform this input/ output operations.
   (d) What is displacement? What is the difference between an intersegment and intrasegment jump?
   (e) What is the mode and I/O configuration for ports A, B, and C of an 8255 after its control register is loaded with 82H?
   (f) The 2's complement signed data contents of AL equal -1 and the contents of CL are -2. What result is produced in AX by executing the following instructions?
   MUL CL and IMUL CL

(5×3)

2. (a) (i) What instructions are needed to program counter 0 for BCD counting in mode 4 of 8254? The initial count is 4788.
   (i) What control word is needed to program counter 2 for binary counting in mode 1, with an initial count of A0H?
   (ii) What instructions are needed to latch the count in counter 1 and save it in register BX. [Assume the control word location as CC83H and initial count to port C at CC80H.]

   (b) Explain the command words ICW1 and ICW2 in 8259 PIC.

(9,6)

3. (a) Explain the mechanism of refreshing the memory of DRAM.
   (b) Interface ADC 0808 with 8086 using 8255 ports. Use port A of 8255 for transferring digital data output of ADC to the CPU and port C for control signals. Assume that an analog input is present at I/P_3 of the ADC and a clock input of suitable frequency is available for ADC. Draw the schematic and write required ALP.
   (c) Explain the basic I/O mode and BSR mode of 8255.

(5,5,5)

4. (a) Design an interface of an input port 74LS245 to read the status of switches SW_1 to SW_8, and an output port 74LS373 with 8086. Display the number of a key that is pressed, i.e., from 1 to 8 on a 7 segment display with the help of an output port. The input port address is 0008H and output port address is 000AH.

(b) Memory locations 00490H through 00493H contain, respectively 0AH, 9CH, B2H and 78H. What does AX contain after each instructions?
(Assume that SI contains 0490H, CS contains 0000H and that BP contains 0002H)
(i) MOV AX, [SI]
(ii) MOV AX, [SI+1]
(iii) MOV AX, [SI][BP]

(9,6)

5. (a) Write a program sequence that will test the byte STATUS and branch to ROUTINE-1 if bits 1, 2 or 4 is 1. Otherwise it is to branch to ROUTINE-2 if both bits 1 and 3 are 1 and to ROUTINE-3 if both bits 1 and 3 are 0. In all other cases it is to execute ROUTINE-4. Assume that the routines are more than 128 bytes long. Also give a flowchart of the sequence.

(b) Show the allocated space caused by the following statements :

(i) BYTE_VAR	DB	'BYTE',12,-12H,3 DUP(0,?,2 DUP(1,2),?)
(ii) WORD_VAR	DW	5 DUP(0,1,2),?,-5,'BY','TE',256H

(c) Write a short note on STACK and PROCEDURE.

(5,5,5)

6. (a) What is the difference between packed BCD arithmetic and unpacked BCD arithmetic. Write a program sequence to show the double precision multiplication

DPZ←DPX*DPY

(b) Explain all the shift and rotate instructions. Assuming (BL)=CEH; (CL)=04 AND (CF)=0, what will be the result of the following

(i) ROL BL,CL
(ii) RCR BL,CL
(iii) SAL BL,CL

(c) Write an ALP to move N elements present at SRCADDR to DSTADDR assuming ((DS)=(ES)).

(5,5,5)