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06EC62

Sixth Semester B.E. Degree Examination, June/July 2015
Microprocessors

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, selecting at least TWO questions from each part.
2. Missing data be suitably assumed.

PART - A

- 1 With reference to architectural diagram of 8086 processor, explain
 - a. The functional diagram of Bus Interface Unit (BIU), with a neat sketch. (05 Marks)
 - b. How are the various segment registers are configured with respect to its size and positioning? (05 Marks)
 - c. The advantages due to memory segmentation. (05 Marks)
 - d. The role of Instruction Queue. (05 Marks)

- 2
 - a. Through appropriate tabulation show how bit assignment is computed for the following fields of an instruction template i) mod ii) reg iii) r/m. (10 Marks)
 - b. State the Machine Control Flags available within the Flag register of the processor. Indicate by what sequence of instructions the Flags can be Set or Reset. Also indicate their positions within Flag register. (07 Marks)
 - c. Consider the following set of instructions executed by the processor
MOV AX, 5439 H
MOV BX, 456A H
ADD AX, BX
Determine the contents of AX after program execution and the status of 6 condition flags. Tabulate Flag status according to their bit positions in the lower byte of Flag register. (03 Marks)

- 3
 - a. What are assembler directives and operators? Explain the significance of the following assembler directives with suitable examples :
i) DB ii) DW iii) DD iv) DQ v) DT (08 Marks)
 - b. Bring out the differences between the usage of the following assembler directives :
i) MACRO ii) PROC. (04 Marks)
 - c. It is required to display 3 messages MSG1, MSG2 and MSG3 on the console. Write an Assembly level program involving MACRO directive and printf as macro name. use suitable text in the Messages MSG. (08 Marks)

- 4
 - a. What is meant by Interrupts and Interrupt Responses? What are the different sources interrupts possible for 8086. At what point of time within the instruction cycle, the status of interrupts are verified by the processor. (05 Marks)
 - b. What are the series of major actions performed by the processor following an interrupt request? (05 Marks)
 - c. Write an assembly level program to create a file RESULT and store in it 500H bytes from the memory block starting at 1000 : 1000, following the occurrence of an interrupt at INTR pin. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42 + 8 = 50, will be treated as malpractice.

PART - B

- 5 Consider the following interface of 8255PPI with 8086 processor :
- Port B is connected with 8 switches $SW_0 - SW_7$ to sense the switch positions logic '0' or '1'.
 - Port A is connected to 8 common cathode LED's to indicate the data received from Port B.
 - Port C lower is connected to 4 LED's to indicate the total number of switches closed. Given that the address of Port A is 0740H, assume the safe current to glow each LED is 25mA.
- Write a neat schematic circuit diagram for the interface specified above. (10 Marks)
 - Develop an assembly language program to read the data from Port B, display it through Port A. Also display the total no. of closed switches through Port C. (10 Marks)
- 6
- Draw a neat interconnection block schematic between 8087 co-processor and the 8086 processor along with other needed accessories. Explain briefly the method of interaction. (10 Marks)
 - Write a program to convert a fractional binary number to its decimal equivalent. Assume that the integer part is represented by 12 bits and the fraction is represented using 4 bits. (10 Marks)
- 7
- What is meant by Minimum mode and Maximum mode operation of 8086 processor? How it is differentiated? List out the pin descriptions of the processor exclusively used for minimum mode configuration. (10 Marks)
 - With reference to Peripheral Component Interface (PCI) bus system :
 - List the significant characteristics of Bus.
 - Draw the basic burst mode timing of PCI involving $PCICLK$, \overline{FRAME} , AD Bus, C/\overline{BE} .
 - Explain the following Bus commands
INTA sequence , Special cycle. (10 Marks)
- 8
- Bring out salient features of 80386DX. (04 Marks)
 - Explain the functions of the following pins of 80386 :
 - M/\overline{IO}
 - W/\overline{R}
 - \overline{ADS}
 - \overline{READY}
 - \overline{LOCK}
 - D/\overline{C}
 (06 Marks)
 - Explain the structure of the following special purpose registers of 80386 :
 - Control Register
 - Debug and Test Register. (10 Marks)
