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10EC/TE62

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

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.*

**PART - A**

- 1 a. Write the memory map of the TPA in a personal computer and explain each of the areas in brief. (10 Marks)
- b. Explain the based, indexed, base indexed and relative addressing modes of 8086 with suitable diagrams and examples. (10 Marks)
- 2 a. Write an assembly language program segment to perform  $(DX) \leftarrow up1 + up2 - up3$  on two digit 10's complement numbers, where up1, up2 and up3 are unpacked two byte data variable memory locations. (10 Marks)
- b. Write the flowchart and assembly language program segment to sort numbers in an array A in descending order using bubble sort. Use I as index. (10 Marks)
- 3 a. Write an assembly language program segment to move a block of data between two overlapping areas and explain with diagrams of overlapping. (10 Marks)
- b. Compare procedure and macro. (04 Marks)
- c. Write an assembly language program segment to move data from VAR2 to VAR1 and also VAR4 to VAR3 using MOVE MACRO (arguments). (06 Marks)
- 4 a. Draw the interrupt vector table and write the sequence of operations that are performed when an interrupt is recognized. (10 Marks)
- b. Write the assembly language program segments to set the trap flag and to reset the trap flag. (06 Marks)
- c. Write the circuit for optically detecting the presence of a new printed circuit -board as it comes out of the machine and keep a count of finished boards, so that we can count any board lost in the machine when a board passes between LED and phototransistor it should signal the NMI input of 8086. Explain the operation of circuit. (04 Marks)

**PART - B**

- 5 a. Interface a  $4 \times 4$  matrix keyboard to 8086 through 4 - bit output port for rows and 8 - bit input for columns. Draw the flowchart and explain the procedure for key press, de-bounce and encoding of the key pressed. (10 Marks)
- b. With a neat diagram interface the multiplexed 4 - digit LED display to microcomputer. Explain the principle of operation. (10 Marks)

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

- 6 a. Draw the block diagram of 8087 and explain. (10 Marks)  
 b. Write the 8087 assembly language program sequence for computing the sample mean and standard deviation and store them at MEAN and STD - DEV respectively where :

$$\text{Standard deviation (STD - DEV)} = \sqrt{\frac{\sum_{i=1}^N (X_i - \text{MEAN})^2}{N-1}};$$

$$\text{sample (MEAN)} = \frac{\sum_{i=1}^N X_i}{N}; x_1, x_2, \dots, x_N \text{ are samples : } N : \text{number of samples. (10 Marks)}$$

- 7 a. Write the typical minimum mode system configuration of 8086 with necessary devices and interconnections and explain. (10 Marks)  
 b. Write the ALP segment to initialize, read and write the parallel port printer without ECP. (06 Marks)  
 c. Explain the features of USB. (04 Marks)
- 8 a. Discuss the flag register, debug and test registers of 80386. (06 Marks)  
 b. Explain the salient features of 80486. (06 Marks)  
 c. Draw the block diagram of Pentium processor and explain the function of each block. (08 Marks).

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