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**Fourth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**Microprocessors**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. Discuss the development of Intel 86 family of microprocessors. Briefly indicate the additional features introduced at each stage of development from 8086 to Pentium IV. (06 Marks)
- b. Explain with a neat sketch the memory map of a personal computer system. (06 Marks)
- c. With a neat sketch explain architecture of 8086. (08 Marks)
- 2 a. Discuss the following Addressing modes of 8086 with example. (06 Marks)
  - i) Register indirect
  - ii) Immediate
  - iii) Base plus index.
- b. What are the different program memory addressing modes? Explain with example. (06 Marks)
- c. Calculate the physical address for the following instructions. Assume DS = 1000H, SS = 7000H, ES = 4000H, BP = 0100H, SI = 0020H, DI = 0200H, BX = 0700H, Values = 0500H.
  - i) MOV AX, [BX] [SI]
  - ii) ADD AL, [BP + 40H]
  - iii) MOV CX, Values [BX] [DI]
  - iv) MOV ES : [1000H], 20H. (08 Marks)
- 3 a. Explain the following assembler directives with example. (10 Marks)
  - i) ASSUME
  - ii) PUBLIC AND EXTRN
  - iii) MACRO AND ENDM
  - iv) MODEL.
- b. Write the instruction template (format) for the following instructions. (06 Marks)
  - i) MOV AX, DX
  - ii) MOV DX, [BP] 0200H
  - iii) MOV AL, [BX] [DI]
- c. What is meant by segment override prefix? Explain with an illustration. (04 Marks)
- 4 a. Explain the working of following 8086 instructions. (08 Marks)
  - i) DAA
  - ii) IMUL
  - iii) REPE CMPSB
  - iv) LOOP.
- b. Differentiate between 'short', 'near' and 'far' jump instruction with example. (06 Marks)
- c. Explain with an example, how parameters can be passed to subroutine, using stack. (06 Marks)

**PART – B**

- 5 a. Differentiate between 'Macros' and Procedures' with an example for each. (08 Marks)
- b. Write an ALP to compute the factorial of a given 8-bit number using recursion. (06 Marks)
- c. Write an ALP to sort a given set of N numbers in ascending order using bubble sort. (06 Marks)
- 6 a. Illustrate with a neat diagram, the working of 8086 in minimum mode. (10 Marks)
- b. Explain the memory read bus cycle of 8086 in minimum mode with a neat diagram. (10 Marks)
- 7 a. Interface four 8KB RAMs starting with an address of 40000H using 3:8 Decoder. Clearly mention the decoding logic and memory map. (10 Marks)
- b. Differentiate between memory mapped I/O and I/O mapped I/O. (06 Marks)
- c. Write a note on Interrupt driven I/O. (04 Marks)
- 8 a. With a neat sketch explain the functioning of 8255 PPI. (10 Marks)
- b. Discuss the control word format of 8255 PPI with a sketch. (10 Marks)

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