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**Fourth Semester B.E. Degree Examination, May/June 2010**  
**Microprocessors**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions, selecting  
at least TWO questions from each part  
2. ALP should be well commented.**

**PART - A**

- 1**
- Explain the internal architecture of 8086, with a neat diagram. (10 Marks)
  - What is meant by pipelining? How is it implemented in 8086? Explain the advantages of pipelining. (05 Marks)
  - Illustrate the concept of segmented memory, with a neat diagram. Explain four advantages of segmentation. (05 Marks)
- 2**
- List any six assembly language program development tools. Explain any four ALP development tools. (10 Marks)
  - Construct the machine code for MOV CL, [BX] instruction. (10 Marks)
- 3**
- Briefly explain various addressing modes of 8086, with suitable instructions. (08 Marks)
  - Explain with an example, how multiple If-Then-Else statement can be implemented, using ALP. (08 Marks)
  - Write an ALP to clear all control flags of 8086. (04 Marks)
- 4**
- Differentiate between a macro and subroutine. (04 Marks)
  - Explain with an example, how parameters can be passed to a subroutine, using stack. (08 Marks)
  - Write an ALP to validate a password. Assume the correct password as SECRET. (08 Marks)
- PART - B**
- 5**
- Explain with examples, the following assembler directives:  
i) EXTRN ii) EVEN iii) TYPE iv) ASSUME. (10 Marks)
  - Compute the factorial of a given 8-bit number using recursion. (10 Marks)
- 6**
- Illustrate with a neat diagram, the working of 8086 in the minimum mode. Also give the timing diagram of I/O read operation. (10 Marks)
  - Interface four 8 KB RAMS starting with an address of 60000H. Draw the memory map and address decoder worksheet. Use 74LS138 decoder for external address decoding. (10 Marks)
- 7**
- List and describe the steps a 8086 will take when it responds to an interrupt. (06 Marks)
  - Briefly explain the operation of 8259, with a neat block diagram. (08 Marks)
  - Describe the response a 8086 will make, if it receives an NMI interrupt signal during a division operation which produces a divide by zero interrupt. Illustrate this concept with a stack diagram. (06 Marks)
- 8**
- Draw the control word format of 8255. Explain it. (08 Marks)
  - Explain different methods of data transfer schemes, with suitable examples. (06 Marks)
  - Write an ALP to display 0 to 9 on a 7-segment LED display device. (06 Marks)

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### THEORY

#### 1. Introduction

The first part of the paper discusses the theoretical background of the study.

#### 2. Methodology

The methodology section describes the research design and data collection methods.

#### 3. Results

The results section presents the findings of the study.

#### 4. Discussion

The discussion section interprets the results and discusses their implications.

#### 5. Conclusion

The conclusion summarizes the main findings and suggests future research.

#### 6. References

The references section lists the sources used in the study.

#### 7. Appendix

The appendix contains supplementary information related to the study.

#### 8. Acknowledgements

The acknowledgements section expresses gratitude to those who assisted in the research.

#### 9. Author Biographies

The author biographies provide information about the researchers involved in the study.

#### 10. Contact Information

The contact information section provides details for reaching the authors.