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Fifth Semester B.E. Degree Examination, June/July 2014
Systems Software

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer any FIVE full questions, selecting
atleast TWO questions from each part.
2. Assume suitable opcodes for various SIC
and SIC/XE instructions wherever needed.**

PART – A

- 1 a. Define system software and explain SIC machine architecture. (10 Marks)
b. Explain SIC/XE instruction format with suitable examples. (04 Marks)
c. Write SIC/XE instructions sequence to add two arrays ALPHA and BETA using indexing and looping (06 Marks)
- 2 a. Write a simple SIC program to read record into a buffer and write record from buffer and hence generate object code. Also write the corresponding object program. (10 Marks)
b. Write an algorithm for pass 1 assembler. (10 Marks)
- 3 a. Describe LTORG assembler directive used to define literals. (04 Marks)
b. Explain the symbol defining statements with suitable examples. (06 Marks)
c. Could a one pass assembler produce a relocatable object program and handle external references? Describe the processing logic that would be involved and identify any potential difficulties. (10 Marks)
- 4 a. Explain the following basic loads functions:
i) Design of an absolute loader; ii) Design of a simple bootstrap loader. (10 Marks)
b. Explain the various loader design options. (10 Marks)

PART – B

- 5 a. What is an interactive editor? Explain the structure of a typical editor. (10 Marks)
b. Briefly explain debugging functions and debugging capabilities. (06 Marks)
c. Write a short note on uses interface criteria. (04 Marks)
- 6 a. How should a programmer decide whether to use a macro or a subroutine to accomplish a given logical function? (04 Marks)
b. Explain the following machine-independent macroprocessor features:
i) Concatenation of macro parameters; ii) Generation of unique labels. (10 Marks)
c. Discuss recursive macro expansion design option. (06 Marks)
- 7 a. Explain the general sections of a typical LEX program and commands to create and execute a typical LEX program. (10 Marks)
b. Write a LEX program to count the number of words, characters, blanks and lines in a given text. (10 Marks)
- 8 a. Discuss YACC grammar, recursive rules and a simple parse tree with suitable examples. (06 Marks)
b. Explain the arithmetic expressions and ambiguous input for a typical YACC program. (10 Marks)
c. Write a short note on the lexer. (04 Marks)

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