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**Fifth Semester B.E. Degree Examination, Dec.2016/Jan.2017**  
**System Software**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1
  - a. What is system software? Explain the features of SIC machine architecture. (10 Marks)
  - b. Explain SIC/XE machine architecture formats and all addressing modes by clearly indicating the setting of different flag bits. (10 Marks)
- 2
  - a. Write and explain the algorithm of PASS-1 of two-pass assembler. (10 Marks)
  - b. Generate the complete object codes for the following assembly level program and give reason if the code is not possible for any instruction.

```

SUM      START  O
FIRST    LDX    #D
          LDA    #O
          +LDB  #TABLE2
LOOP     ADD    TABLE, X
          ADD    TABLE2, X
          TIX   COUNT
          JLT   LOOP
          +STA  TOTAL
          STA  @TOTAL
          RSUB
COUNT  RESW  1
TABLE   RESW  3000
TABLE2  RESW  3000
TOTAL   RESW  1
          END   FIRST

```

Assume below opcodes (all in hexadecimal) LDX = 04, LDA = 00, LDB = 68, ADD = 18, TIX = 2C, JLT = 38, STA = 0C, RSUB = 4C. (10 Marks)

- 3
  - a. Compare a two-pass assembler with a one-pass assembler. How forward references are handled in one pass assemblers? (10 Marks)
  - b. Discuss the detailed design of a linking and relocating loader. (05 Marks)
  - c. Explain in detail program blocks. (05 Marks)
- 4
  - a. Give and explain the algorithm or source program for a simple Bootstrap loader. (08 Marks)
  - b. Explain the various data structures used for a linking loader. (07 Marks)
  - c. With examples explain any FIVE loader options. (05 Marks)

PART – B

- 5 a. Explain the structure of a text editor, with a neat diagram. (10 Marks)  
b. Explain briefly the debugging functions. (06 Marks)  
c. List the important tasks to be accomplished by a text editor for an interactive user computer dialogue. (04 Marks)
- 6 a. Define Macro. Discuss in detail the various data structures used in the implementation of a one-pass macro processor. (10 Marks)  
b. Explain the following features:  
i) Concatenation of macro-parameters. (10 Marks)  
ii) Generation of unique labels. (06 Marks)
- 7 a. Explain the structure of LEX. (04 Marks)  
b. Discuss the Lexer-Parser communication. (04 Marks)  
c. Write the LEX program to count the number of words, number of characters, number of lines from the input file. (10 Marks)
- 8 a. Explain the regular expressions with proper examples. (06 Marks)  
b. Explain the shift reduce parser. (05 Marks)  
c. Write program in LEX and YACC to recognize whether the given arithmetic expression is valid or invalid. (07 Marks)  
d. Define recursive rule. Give an example. (02 Marks)

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