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.
       ii) Generation of unique labels.   (10 Marks)

7   a. Explain the structure of LEX.   (06 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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