Fifth Semester B.E. Degree Examination, Dec.2014/Jan.2015

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. Distinguish between system software and application software. **(04 Marks)**
   b. Explain SIC/XE architecture. **(06 Marks)**
   c. Write a SIC/XE program to copy array A of 100 words to array B of same size. **(06 Marks)**
   d. What is upward compatible? How is it ensured between SIC and SIC/XE? **(04 Marks)**

2 a. Explain briefly the SIC assembler directives with examples. **(06 Marks)**
   b. What is relocation? Illustrate how a modification record is used in relocation of program. **(04 Marks)**
   c. Generate the machine codes for the following SIC/XE program.

COPY	START	1000
CLOOP	+JSUB	RDREC
	LDA	LENGTH
	COMP	ZERO
	JEQ	EXIT
	J	CLOOP
EXIT	STA	BUFFER
	LDA	THREE
	STA	TOTAL_LENGTH
	RSUB	
BUFFER	RESW	100
EOF	BYTE	C 'EOF'
ZERO	WORD	0
THREE	WORD	3
LENGTH	RESW	1
TOTAL_LENGTH	RESW	1
RDREC	LDX	ZERO

MNEMONICS:
JSUB = A0,   LDA = 80,   LDX = 60,   STA = 50,
COMP = 90,   RSUB = 4C,   JEQ = B0,   J = B8 **(10 Marks)**

3 a. What is a literal? Differentiate literals from immediate data. **(04 Marks)**
   b. Explain the following machine independent features of SIC assembler:
      i) Symbol defining statements
      ii) Control sections **(08 Marks)**
   c. Explain the two design options of one-pass assembler. **(08 Marks)**

4 a. Write the algorithm of absolute loader. **(04 Marks)**
   b. Write the algorithm of linking loader. **(10 Marks)**
   c. Explain briefly the design options of loaders. **(06 Marks)**

PART – B

5   a. List the basic tasks of a text editor. (04 Marks)
    b. With a neat diagram, explain the text editor structure. (06 Marks)
    c. List the user interfaces for editors with an example for each. (04 Marks)
    d. What are the debugging functions and capabilities? (06 Marks)

6   a. Give the features of MACROPROCESSORS and explain the data structures used in macro processors. (08 Marks)
    b. Explain the general purpose macroprocessors design option. (04 Marks)
    c. For the following macro definition, expand the macro call statements called in sequence:
       i) RDBUFF F1, BUFA, RLEN, 04, 1024
       ii) RDBUFF F2, BUFB, RLNG, ,

```
RDBUFF   MACRO  &INDEV, &BUFADR, &RECLTH, &EOR, &MAXLTH
         IF     (&EOR NE ' ')
&EORCK   SET    1
         ENDIF
         CLEAR  X
         CLEAR  A
         IF     (&EORCR EQ1)
         LDCH   =X '&EOR'
         RMO    A, S
         ENDIF
         IF     (&MAXLTH EQ ' ')
         +LDT   #4096
         ELSE
         +LDT   #&MAXLTH
         ENDIF
$LOOP    TD     =X '&INDEV'
         JEQ    $LOOP
         RD     =X '&INDEV'
         STCH   &BUFADR, X
         TIXR   T
         JLT    $LOOP
         STX    &RECLTH
         MEND
```
(08 Marks)

7   a. List any ten regular expression in lex. (10 Marks)
    b. Distinguish between LEXER and Handwritten lexer. (04 Marks)
    c. Write lex program to compute word, character and line count in a given file. (06 Marks)

8   a. Explain the format of yacc program. (04 Marks)
    b. Write lex-yacc program to validate simple arithmetic expression. (08 Marks)
    c. Explain briefly lex and yacc interaction. (04 Marks)
    d. Discuss conflicts in yacc. (04 Marks)

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