Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
System Software

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Bring out the differences between Application software and System software. (04 Marks)
b. Explain SIC/XE machine instruction formats and all addressing modes by clearly indicating the setting of different flag bits. (10 Marks)
c. Write a subroutine in SIC/XE to read a 100-byte record from a device 'F5' into BUFFER. Use immediate and register-to-register instructions. (06 Marks)

2 a. Write and explain the algorithm of PASS-1 of two-pass assembler. (10 Marks)
b. Generate the complete object program for the following assembly level program.

```
SUM       START   0
FIRST     CLEAR   X
          LDA     #0
          +LDB    #TOTAL
          BASE    TOTAL
LOOP      ADD     TABLE,X
          TIX     COUNT
          JLT     LOOP
          STA     TOTAL
COUNT     RESW    1
TABLE     RESW    2000
TOTAL     RESW    1
          END     FIRST
```

Assume below opcodes (all in hexadecimal)

CLEAR – B4	LDA – 00	LDB – 68	ADD – 18
TIX – 2C	JLT – 38	STA – 0C	(10 Marks)

3 a. Distinguish between literal and immediate operands. How does the assembler handle the literal operand? (04 Marks)
b. Compare a two-pass assembler with a one-pass assembler. How forward references are handled in one-pass assemblers? (10 Marks)
c. Write a note on MASM assembler. (06 Marks)

4 a. Give and explain the algorithm or source program for a simple Bootstrap loader (08 Marks)
b. Distinguish between linking loader and linkage editors. (04 Marks)
c. Explain dynamic linking with suitable diagrams. (08 Marks)

PART – B

5 a. Explain the structure of a text editor with a neat diagram. (10 Marks)
b. Explain the functions and capabilities of an interactive debugging system. (06 Marks)
c. Write a note on the aspect of user-interface criteria. (04 Marks)

6 a. What are the basic functions of macroprocessor? Explain the various data structures used in the implementation of a one-pass macroprocessor

b. Using the following definition, expand the following macro calls, called in sequence.
(i) LABEL RDBUFF F2, BUFFER, LENGTH, (04, 12)
(ii) RDBUFF OE, BUFF, RLENG, , 2048

```
RDBUFF  MACRO &INDEV, &BUFADR, &RECLTH, &EOR, &MAXLTH
&EORCT  SET     %NITEMS (&EOR)
        CLAER   X
        CLEAR   A
        IF      (&MAXLTH EQ '')
        +LDT    #4096
        ELSE
        +LDT    #&MAXLTH
        ENDIF
$LOOP   TD      =X '&INDEV'
        JEQ     $LOOP
        RD      =X '&INDEV'
&CTR    SET     1
        WHILE   (&CTR LE &EORCT)
        COMP    =X '0000 &EOR[&CTR]'
        JEQ     $EXIT
&CTR    SET     &CTR+1
        ENDW
        STCH    &BUFADR, X
        TIXR    T
        JLT     $LOOP
$EXIT   STX     &RECLTH
        MEND
```

c. Write a short note on 'Keyword macro parameters'. (07 Marks)

7 a. List and explain the different design options for a macro processor. (12 Marks)
b. Write a short note on 'Parser – lexer communication'. (03 Marks)
c. Write a LEX program to count the number of vowels and consonants in a given string. (05 Marks)

8 a. Explain regular expressions in UNIX with proper examples. (06 Marks)
b. Explain the structure of a YACC program. (06 Marks)
c. Give the LEX and YACC specifications to recognize parenthesized arithmetic expressions. (08 Marks)

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