

**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. (10 Marks)

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

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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 SEXIT
&CTR SET &CTR+1
        ENDW
        STCH &BUFADR, X
        TIXR T
        JLT $LOOP
SEXIT STX &RECLTH
        MEND

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(07 Marks)

c. Write a short note on 'Keyword macro parameters'.

(03 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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