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06CS52

**Fifth Semester B.E. Degree Examination, December 2012**  
**Systems Software**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Explain all the addressing modes supported by SIC/XE by indicating the different bit settings in an instruction. (08 Marks)
- b. Write a sequence of instructions for SIC/XE to set BETA equal to ALPHA + INCR – 1 and DELTA equal to GAMMA + INCR – 1. (Use register operation). (06 Marks)
- Write a subroutine in SIC to read a 100 – byte record from a device 'F5' into memory. (06 Marks)
- 2 a. Explain the following assembler directives, with an example each :  
 i) START ii) BYTE iii) RESW iv) BASE. (04 Marks)
- b. Write an algorithm for pass – 1 of assembler. (06 Marks)
- c. Generate the complete object program for the following ALP. Assume standard SIC model and assume the following :
- LDA → 00      TIX – 2C  
 LDX → 04      JLT – 38  
 STA → 0C      RSUB – 4C  
 ADD → 18
- Source program

SUM	START	4000
FIRST	LDX	ZERO
	LDA	ZERO
LOOP	ADD	TABLE, X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
	RSUB	
TABLE	RESW	2000
COUNT	RESW	1
ZERO	WORD	0
TOTAL	RESW	1
	END	FIRST

(10 Marks)

- 3 a. Distinguish between literal and immediate operands. How does the assembler handler the literal operand? (06 Marks)
- b. Explain the absolute and relative expression? How these are processed by an assembler? (06 Marks)
- c. Explain how multipass assembler handles the following forward reference (08 Marks)

1	HALFSZ	EQU	MAXLEN/2
2	MAXLEN	EQU	BUFEND - BUFFER
3	PREVIST	EQU	BUFFER - 1
4	BUFFER	RESB	4096
5	BUFEND	EQU	*

Assume that when assembler reaches line no.4, location counter contains 1034 (Hex).

- 4 a. Explain the functions of loader. Also write an SIC /XE ALP for boot strap loader. (08 Marks)  
 b. Explain the various data structures used for a linking loader? (06 Marks)  
 c. Discuss the different loader options, with an example each. (06 Marks)

### PART – B

- 5 a. What is an interactive editor? Explain briefly structure of a typical editor, with help of suitable block diagram (10 Marks)  
 b. Explain the functions and capabilities of an interactive debugging system. (06 Marks)  
 c. Write a note on user – interface criteria. (04 Marks)
- 6 a. Explain the various data structures used in the implementation of macroprocessors. (08 Marks)  
 b. Describe the concatenation of macro processors. (04 Marks)  
 c. Using the following definition, expand the following macro invocation statements.  
 i) RDBUFF F2, BUFFER, LENGTH, (00, 03, 04)  
 ii) RDBUFF F1, BUFFER, LENGTH, (04, 12)

RDBUFF	MACRO	&INDEV, &BUFADR, &RECLTH, &EOR %
&EORCT	SET	NITEMS (&EOR)
	CLEAR	X
	CLEAR	A
	+LDT	#4096
\$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	

(08 Marks)

- 7 a. Explain the structure of a LEX program? (06 Marks)  
 b. What is a regular expression? Explain the following characters that form regular expression with example each?  
 i) [ ] ii) { } iii) \. (08 Marks)  
 c. Write is LEX program to count the number of vowels and consonants in a given string. (06 Marks)
- 8 a. What is shift – reduce parsing? Explain the processing of input “fred = 14 + 23 – 11” and represent it, using parse tree. (10 Marks)  
 b. Write YACC program to evaluate the arithmetic expression. Consider all possible cases. (08 Marks)  
 c. Explain the use of rule’s action? (02 Marks)

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