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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Fifth Semester, B.E. - Information Science and Engineering
Semester End Examination; Dec - 2016/Jan - 2017
System Software

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	Distinguish between system software and application software.	4
b.	What is upward compatible? How is it ensured between SIC and SIC/XE?	4
c.	Write a SIC and SIC/XE program to copy the contents of array Alpha of 100 words to array Beta of same size.	12
2 a.	With respect to Pentium pro architecture explain the following :	
	i) Instruction format ii) Data format	10
	iii) Registers iv) Addressing modes.	
b.	Explain the instruction formats and addressing modes of SIC/XE machine architecture.	10

UNIT - II

3 a. Generate the object code for each statement and write the object program for the following SIC / XE program.

Given that : CLEAR = B4, LDA = 00, LDB = 68, ADD = 18, TIX = 2C, JLT = 38, STA = 0C

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

(10, placed at right of this block)

b. What are control sections? Explain how linking is performed between control sections?   10

4 a. Explain how multi-pass assembler handles the following forward reference :

    (i) HALFSZ   EQU   MAXLEN/2

    (ii) MAXLEN EQU   BUFF END – BUFFER

    (iii) PREVBT EQU   BUFFER – 1   10

    (iv) BUFFER   RESB 4096

    (v) BUFFEND EQU *

    Assume that, when assembler goes to line (iv), location counter contains 1034 (HEX).

  b. Explain the design options of one-pass assembler.   10

UNIT - III

5 a. With source code, explain the working of bootstrap loader.   10

  b. Illustrate linking and relocation with sample programs.   10

6 a. Explain machine independent features of loader.   10

  b. Write and explain the pass 2 algorithm of linking loader.   10

UNIT - IV

7 a. Explain the data structures used in Macro processor with example.   8

  b. With an example, explain generation of unique labels in macros.   6

  c. Explain the advantages and disadvantages of general purpose macro processor.   6

8 a. Explain the process of conditional macro expansion with example.   8

  b. Write and explain DEFINE and EXPAND procedures in one pass macro processor.   12

UNIT - V

9 a. Write a LEX program to compute word, character and line count in a given file.   6

  b. Explain briefly LEX and YACC interaction.   4

  c. What are regular expressions? Explain the characters used in forming regular expressions.   10

10 a. Explain the ambiguity in arithmetic expression. What is the ambiguity in parsing $2 + 3 \times 4$? Explain the solution for it.   10

  b. Write a YACC program to evaluate a simple arithmetic expression involving operation $+, -, *, /$.   10

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