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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. - 2014

System Software

Time: 3 hrs *Max. Marks: 100*

***Note**: i) Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.*
ii) Assume suitable missing data if any

PART - A

1. a. Briefly discuss the architecture of SIC/XE machine. 10

   b. Write a program for SIC machine to copy 11 byte string from one location to another. 6

   c. What is an Assembler directive? Give examples. 4

2 a. Write an algorithm for pass 1 of assembler. 10

   b. Generate the object code for the following program.

COPY	START	0
FRST	STL	RETADR
	LDB	#LENGTH
	BASE	LENGTH
CLOOP	+J SUB	RDREC
	LDA	LENGTH
	COMP	# 0
	JEQ	ENDFIL
	+J SUB	WRREC
	J	CLOOP
ENDFIL	LDA	EOF
	STA	BUFFER
	LDA	#3
	STA	LENGTH
	+JSUB	WRREC
	J	@ RETADR
EOF	BYTE	C ‘EOF’
RETADR	RESW	1
LENGTH	RESW	1
BUFFER	RESB	4096

OpCode table	
STL	14
LDB	68
+JSUB	48
LDA	00
COMP	28
JEQ	30
J	3C
STA	0C
RDREC	8036
WRREC	805D

10

Contd…2

3. a.	Explain the working principle of control sections and program linking.	10
b.	Write short note on: (i) Multi – pass assemblers (ii) Literals	10
4 a.	What is an absolute loader? Write the source code for bootstrap loader.	7
b.	Explain the processing of an object program using (i) linking loader (ii) linkage editor.	6
c.	Explain an algorithm for pass 2 of a linking loader.	7

PART - B

5 a.	Write complete algorithm for a one-pass macro processor.	10
b.	Explain the following with suitable example: (i) Macro expansion (ii) Nested Macros.	4
c.	List and explain different types of data structure used in macro processor.	6
6 a.	With example, explain any two machine independent macro processor features.	10
b.	Explain recursive macro expansion taking an example.	10
7 a.	Explain the following basic variables and functions: i) output ( ) (ii) yytext ii) yylex ( ) (iv) input ( ) v) yymore ( )	10
b.	List any four meta character used in LEX and explain with example.	4
c.	Write a LEX program to count the no. of ‘scanf’ and ‘printf’ statemtnts in a C – program. Replace them with readf’ and ‘writef’ statements respectively.	6
8 a.	With neat syntax explain all the sections used in YACC – program.	10
b.	Write the YACC program to recognize strings ‘aaab’, ‘abbb’, ‘ab’ and ‘a’ using grammar ($a^n b^n$, n > = 0)	10

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