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P.E.S. College of Engineering, Mandya - 571 401
 (An Autonomous Institution affiliated to VTU, Belgaum)
Fifth Semester, Computer 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. Explain the instruction formats and addressing modes of SIC/ XE machine architecture with example. 12
- b. Write a sequence of instructions for SIC to set ALPHA equal to the product of BETA and GAMMA. Assume that ALPHA, BETA and GAMMA of one word in size. 8
- 2 a. Generate the complete object program for the following assembly level program. Also indicate the contents of symbol table at the end assume standard SIC model and assume the following machine OPCODES in HEX. 12
- ```

LDA → 00, TIX → 20,
LDX → 04 JLT → 38
STA → 0C RSUB → 4C
ADD → 18

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

```
- b. Briefly explain program relocation advantage and disadvantage. 8
- 3 a. Define control section. How does control section differ from the program blocks? Explain with an example. 10

- b. Explain how expressions are handled considering all possibilities. 5
- c. Compare ORG with EQU with example. 5
- 4 a. Give and explain the algorithm or source program for a simple bootstrap loader. 10
- b. Explain the algorithm and data structures for a linking loader. 10

### PART - B

- 5 a. With a diagram, explain how object program can be processed using linkage editor. 10
- b. Explain with a figure, dynamic linking. Discuss its advantages. 10
- 6 a. With suitable example explain macro processor algorithm and data structure used. 12
- b. With suitable example explain macro definition and expansion. 8
- 7 a. Explain three basic sections of a LEX program. Write a program to count the number of characters and lines in a file. 10
- b. Explain YYIN, YYLVAL, YYTEXT, YYLEX, YYWRAP of LEX with suitable example. 10
- 8 a. Explain the structure of YACC program. 10
- b. Write YACC program to recognize the given arithmetic expression containing +, -, /, x operator with + and - having highest precedence. 10

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