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P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belgaum)
Fifth Semester, B.E. - Computer 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.	Explain in detail SIC machine architecture.	10
b.	Write SIC program: suppose ALPHA is an array of 100 words, write a program to arrange the 100 words in ascending order and store the result in an array BETA of 100 words.	10
2 a.	Discuss registers, instruction formats, addressing modes, instruction set with respect to SIC/XE machine.	10
b.	Write short notes on VAX machine architecture.	6
c.	Compare CISC and RISC machines.	4

UNIT - II

3 a.	Define Assembler. Write and explain the algorithm of pass-1 of 2-pass assembler.	10
b.	Write the format of header record, text record, end record, define and refer record.	10
4 a.	Write SIC/XE program for (ALPHA+INCR-1) = BETA and (GAMMA+INCR-1) = DELTA expressions and also generate object code. (Assume desired starting address, LDA - 00, LDS - 6C, ADDR - 90, ADD - 18, STA - 0C, SUB - 1C, LDT - 74).	12
b.	How literals are handled by assembler? Explain with example.	8

UNIT - III

5 a.	Explain with example, how relocation is done using bit mask and modification record?	10
b.	Explain how linking loader and linkage editors help in processing object program?	10
6 a.	Explain bootstrap loader with algorithm.	10
b.	Write short note on dynamic linking.	6
c.	Write an algorithm for absolute loaders.	4

UNIT - IV

7 a.	Explain with an example macro definition, macro invocation and macro expansion.	10
b.	List and explain the different data structures used in implementation of one pass macro processors.	10
8 a.	Explain the following machine-independent macro processor features : i) Concatenation of macro parameter ii) Generation of unique label	10

   b.   Write a short notes on MASM and ANSI C macro processor.   10

UNIT - V

9 a.   Write and explain the structure of LEX and YACC programs.   8

   b.   Explain the significance of *yytext* and *yyleng* in LEX program.   2

   c.   Write a YACC program to recognize the grammer ($a^n b^n$ where $n > 0$).   10

10 a. With diagram, explain how LEX and YACC communicates each other?   5

   b.   Write a LEX program to count number of spaces, words, lines in a given input string.   10

   c.   With example explain how *yywrap( )* works in LEX and YACC programs.   5

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