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07MCA31

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Third Semester MCA Degree Examination, Dec.08/Jan.09
Systems Software

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions.

- 1
 - a. Define System Software. Give examples for System Software. Write the difference between system software and application software. (06 Marks)
 - b. Explain the data formats, instruction formats and addressing modes of SIC/XE machine architecture. (10 Marks)
 - c. What are a near jump and a far jump? What is the difference between near jump and far jump? (04 Marks)

- 2
 - a. Discuss the need for a two pass assembler and explain its functions. (08 Marks)
 - b. What are assembler directives? Explain the following assembler directives with examples, i) LORG; ii) EQU. (06 Marks)
 - c. What is program relocation? How will you solve the relocation problem? (06 Marks)

- 3
 - a. Differentiate between a literal and immediate operand with an example. (04 Marks)
 - b. Explain MASM assembler in detail. (10 Marks)
 - c. How forward references are handled in multipass assembler? (06 Marks)

- 4
 - a. Mention the functions of a loader. How are these tasks accomplished in an absolute loader? (10 Marks)
 - b. Explain the working of a relocating loader with an example. (10 Marks)

- 5
 - a. Explain the structure of a text editor in detail. (10 Marks)
 - b. Explain the various data structures required for the design of a macro processor with an example. (10 Marks)

- 6
 - a. Explain conditional macro expansion with an example. (10 Marks)
 - b. What do you mean by a MACRO? Explain macro definition and expansion with suitable example. (10 Marks)

- 7
 - a. Explain the various sections of a LEX specification using a basic word count program. (08 Marks)
 - b. Explain the following regular expression with examples.
i) []; ii) { }; iii) /; iv) (). (08 Marks)
 - c. What is a parse tree? Give an example. (04 Marks)

- 8 Write short notes on:
 - a. Automatic library search.
 - b. Dynamic linking.
 - c. Shift / Reduce parsing.
 - d. Tracing and Traceback debugging functions (20 Marks)


 Third Semester MCA Degree Examination, June-July 2009
Systems Software

Srinivas Institute of Technology

Library, Mangalore

Max. Marks: 100

Time: 3 hrs.

Note: Answer any FIVE full questions.

- 1 a. Describe the following with respect to Simplified Instructional Computer (SIC) machine:
 i) Memory ii) Registers iii) Data format iv) Instruction set v) Addressing modes. (10 Marks)
- b. Consider that ALPHA is an array of 100 words. Write a set of instructions for SIC to set all 100 elements of the array to 0. (06 Marks)
- c. Explain the different instruction formats of SIC/XE machine. (04 Marks)
- 2 a. Write an algorithm for pass-2 of a 2-pass assembler. Explain the functions of it. (10 Marks)
- b. Describe the data structures used in pass-1 assembler. (04 Marks)
- c. Generate object code for the given SIC program, (06 Marks)
- ```

WRDATA START 1000
 LDX ZERO
WLOOP TD OUTPUT
 JEQ WLOOP LDX-04
 LDCH BUFFER, X TD-EO
 WD OUTPUT JEQ-30
 TIX LENGTH LDCH-50
 JLT WLOOP WD-DC
ZERO WORD 0 TIX-2C
OUTPUT BYTE X'05' JLT-38
LENGTH RESW 1
BUFFER RESB 4096
 END WRDATA

```
- 3 a. Write short notes on the following machine independent features of assembler:  
 i) Expressions ii) Program blocks. (10 Marks)
- b. Describe the design of multi-pass assembler. (10 Marks)
- 4 a. Explain the program of a bootstrap loader. (10 Marks)
- b. With a neat diagram, explain the concept of dynamic linking. (10 Marks)
- 5 a. With a neat block diagram, describe the typical editor structure. (10 Marks)
- b. Discuss the debugging functions and capabilities of interactive debugging system. (10 Marks)
- 6 a. Write an algorithm for one-pass macro processor. (10 Marks)
- b. Write a note on the following machine – independent features of macroprocessor:  
 i) Concatenation of macro parameters.  
 ii) Generation of unique labels.  
 iii) Keyword macro parameters. (10 Marks)
- 7 a. Explain the following terms with respect to LEX, give an example to each:  
 i) yylex() ii) yyin iii) yyleng iv) yytext v) yywrap(). (10 Marks)
- b. Write a Lex program to count the number of characters, words and lines in a given file. (06 Marks)
- c. What do the following notations of regular expressions match:  
 i) • ii) \* iii) ? iv) ^ (04 Marks)
- 8 a. Write Lex and Yacc program to recognize a valid expression. (10 Marks)
- b. Explain the structure of Yacc program with example. (10 Marks)

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**Third Semester MCA Degree Examination, Dec.09-Jan.10**  
**System Software**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. Define system software. Bring out the differences between system software and application software. (05 Marks)
  - b. Describe the following with respect to SIC/XE machine : i) Memory ii) Data format iii) Instruction format iv) Registers. (10 Marks)
  - c. Write a assembly language program in SIC/XE to add 2 arrays of 200 integers. (05 Marks)
  
- 2
  - a. Explain architecture of Cray T3E machine. (10 Marks)
  - b. Explain the concept of program relocation with the help of a neat figure. (10 Marks)
  
- 3
  - a. Explain any five assembler directives with examples. (10 Marks)
  - b. Explain the algorithm of pass 1 of a 2 pass assembler. What are the tables created by pass 1? (10 Marks)
  
- 4
  - a. With programming example, explain a simple bootstrap loader. (08 Marks)
  - b. Explain with a neat diagram, loading and calling of a subroutine using dynamic linking. (12 Marks)
  
- 5
  - a. Discuss the debugging functions and capabilities of interactive debugging systems. (08 Marks)
  - b. Differentiate between functions and macros. (04 Marks)
  - c. Explain the following terms with examples. (08 Marks)
    - i) Macro definition.
    - ii) Macro invocation / macro call.
    - iii) Macro expansion.
    - iv) Conditional macro expansion.
  
- 6
  - a. Explain with an example recursive descent parser. (08 Marks)
  - b. Discuss any two machine independent code optimization technique with examples. (04 Marks)
  - c. With the help of a typical example and neat figure, explain the concept of shift reduce parsing. (08 Marks)
  
- 7
  - a. Explain the structure of Yacc program with example. (06 Marks)
  - b. Explain the following terms with respect to lex, give example to each : (10 Marks)
    - i) yylex () ii) yyin () iii) yy leng () iv) yylext () v) yywrap ()
  - c. What do the following notations of regular expression represent? (04 Marks)
    - i) . ii) \* iii) ^ iv) \$ v) { } vi) ?
  
- 8 Write short notes on : (20 Marks)
  - a. MASM assembler.
  - b. Linkage editors.
  - c. Conditional macro expansion.
  - d. MS – DOS linker.

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

