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15CS63

Sixth Semester B.E. Degree Examination, June/July 2018
System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

- 1 a. Define system software. Distinguish between system software and application software. (06 Marks)
 b. List out registers used in SIC/XE machine architecture along with their use. (10 Marks)

OR

- 2 a. Explain the data structures and pass-1 algorithm of SIC assembler. (08 Marks)
 b. Define Macro. Give the features of macro processors and explain the data structures used in macro processors. (08 Marks)

Module-2

- 3 a. What is loader? What are advantages and disadvantages? Explain boot strap loader with algorithm. (08 Marks)
 b. Enlist any four different loader option commands. (04 Marks)
 c. Define the following: i) Linking loader ii) Dynamic linking. (04 Marks)

OR

- 4 a. Explain the working of linkage editor and linking loader. (08 Marks)
 b. Write the data structures and pass 2 algorithm for linking loader. (08 Marks)

Module-3

- 5 a. What is compiler? Explain various phases of compiler with help of neat diagram. (10 Marks)
 b. Explain the concept of input buffering in the lexical analysis. (06 Marks)

OR

- 6 a. Construct the transition diagram to recognize the tokens given below:
 i) Identifier ii) Relational operator iii) Unsigned number. (08 Marks)
 b. Create a lexical analyzer with Lex and explain the structure of Lex programs. (08 Marks)

Module-4

- 7 a. What is top down parser? What are key problems in top down parsing? (08 Marks)
 b. Explain the ambiguity in arithmetic expression. What is the ambiguity in parsing $2 + 3 \times 4$? Explain the solution for it. (08 Marks)

OR

- 8 a. What is meant by handle processing? How it helps on shift reduce parsing? List the actions of a shift reduce parser. (08 Marks)
- b. Form the Action/Goto table for the following grammer:
 $S \rightarrow Aa|bAc|Ba|bBa$
 $A \rightarrow d$
 $B \rightarrow d$
Justify whether the grammer is LR (0) or not. (08 Marks)

Module-5

- 9 a. Discuss S-attributes and L-attributes with respect to SDD (Syntax Directed Definition). (04 Marks)
- b. Construct the syntax tree for the expression $x * y - 5 + z$. (04 Marks)
- c. Explain the translation of expression address code of
i) Quadruples ii) Triples iii) Indirect triples, with examples. (08 Marks)

OR

- 10 a. Briefly explain the main issues in code generation. (08 Marks)
- b. Generate code for the following expression using the code generator algorithm.
 $x := (a + b) * (c - d)$. (08 Marks)

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