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18CS61

## Sixth Semester B.E. Degree Examination, July/August 2022 System Software and Compilers

Time: 3 hrs.

Max. Marks: 100

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

### Module-1

- 1 a. Explain in detail SIC/XE Machine Architecture. (10 Marks)
- b. List the various machine independent assembler features. Explain the control sections how the assembler convert them into object code. (10 Marks)

**OR**

- 2 a. Write an algorithm for One Pass Assembler and give sample object program from One Pass Assembler. (10 Marks)
- b. What are the basic functions of loader? Explain two ways of program relocation in loaders. (10 Marks)

### Module-2

- 3 a. Explain various phases of Compiler. Show the translations for an Assignment statement.  
Position = Initial + rate \* 60.  
Clearly indicate the output of each phase. (12 Marks)
- b. What are the applications of Compiler? Explain. (08 Marks)

**OR**

- 4 a. Write a brief note on Language Processing System. (06 Marks)
- b. Explain the concept of input buffering in the Lexical analysis with its implementation. (10 Marks)
- c. Define Token, Lexeme and Pattern with example. (04 Marks)

### Module-3

- 5 a. Define Context Free Grammar. Obtain CFG to generate strings of a's and b's having substring "ab". (10 Marks)
- b. Consider grammar given below from which any arithmetic expressions can be obtained.  
 $E \rightarrow E + E \quad E \rightarrow E - E \quad E \rightarrow E * E \quad E \rightarrow E | E \quad E \rightarrow id$   
Show that the grammar is ambiguous for the sentence  $id + id * id$ . (10 Marks)

**OR**

- 6 a. Write an algorithm to eliminate left recursion from a grammar. Eliminate left recursion from the given grammar.  $S \rightarrow Aa | b \quad A \rightarrow Ac | Sd | \epsilon$ . (10 Marks)
- b. Define Shift – Reduce Parser and Handle. What are conflicts in shift – reduce parse, explain with example. (06 Marks)
- c. List and explain different actions of shift – reducer parser (04 Marks)

### Module-4

- 7 a. Explain the three basic section of LEX program with example. (10 Marks)
- b. Write LEX program to count word, character and line count in a given file. (10 Marks)

