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10CS63

Sixth Semester B.E. Degree Examination, Feb./Mar. 2022
Compiler Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Explain various phases of compiler. Show the translation for an Assignment statement : Position = initial + rate * 60 **(10 Marks)**

b. Explain input buffering strategy, used in lexical analysis? Explain how sentinels are handled using buffers. **(10 Marks)**

2 a. What is left recursion and left factoring? Explain with an example. **(06 Marks)**

b. Give a formal definition of a CFG. Design a CFG for a simple arithmetic expression. **(06 Marks)**

c. Explain panic mode recover and global correction error recovery strategies. **(08 Marks)**

3 a. Given the grammar

$E \rightarrow E + T \mid T$

$T \rightarrow T * F \mid F$

$F \rightarrow (E) \mid id$

i) Compute FIRST and FOLLOW sets

ii) Construct the predictive parsing table

iii) Show the moves made by predictive parser on the input id + id * id. **(10 Marks)**

b. What is handle and handle pruning? How they are used in the STACK implementation of shift –Reduce parser? Show the configurations of a shift-reduce-parser n input $id_1 * id_2$ for the grammar in Q.3a. **(10 Marks)**

4 a. Obtain a set of Canonical LR(0) items for the grammar :

$S \rightarrow L = R \mid R$

$L \rightarrow * R \mid id$

$R \rightarrow L$ **(08 Marks)**

b. Write an algorithm for constructing LALR parsing table. **(08 Marks)**

c. Write a note on the parser generator – YACC. **(04 Marks)**

PART – B

5 a. Explain the concept of syntax – directed definition. **(04 Marks)**

b. i) Give a SDD for a simple desk calculator

ii) Construct annotated parse tree for the input string 3 * 5 + 4n **(08 Marks)**

c. Write a postfix SDT for desk calculator and show parser stack implementation. **(08 Marks)**

6 a. Obtain the directed acyclic graph for the expression a + a * (b – c) + (b – c) *d **(06 Marks)**

b. Explain the following with example: i) Quadruples ii) Triples iii) Indirect triples. **(06 Marks)**

c. Explain SDT of switch statement. **(08 Marks)**

7 a. With a neat diagram, explain the typical subdivision of runtime memory? **(10 Marks)**

b. What is activation record? Explain structure and purpose of each field in the activation record. **(06 Marks)**

c. Explain the performance metrics to be considered while designing a garbage collector. **(04 Marks)**

8 a. Discuss the issues in the design of code generator. **(10 Marks)**

b. How register allocation and evolution order plays an important role in a code generation? **(06 Marks)**

c. Define flow graph. How it is constructed? **(04 Marks)**

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