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06IS662

Sixth Semester B.E. Degree Examination, June/July 2011
Complier Design

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. With neat sketch explain the structure of complier. **(10 Marks)**

b. Construct the transition diagram for relational operators (=, <, <=, >, >= and < >). Write a lexical analyzer to recognize the above mentioned relational operators. (write code for START state, one intermediate state and one final state). **(10 Marks)**

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

b. Describe the working of a predictive parser and write the parsing table for the grammar

$S \rightarrow i\ E\ t\ SS' \mid a$

$S' \rightarrow eS \mid \in$ (epsilon)

$E \rightarrow b$

Is this grammar LL(1)? Justify your answer. **(14 Marks)**

3 a. What is handle and handle pruning? How they are used in the STACK implementation of shift reduce parser? Explain with the grammar $E \rightarrow E + E \mid E * E \mid (E) \mid id$ on the input string $w = id_1 + id_2 * id_3$. **(06 Marks)**

b. Construct SLR(1) parsing table for the following grammar G.

$S \rightarrow L = R$

$S \rightarrow R$

$L \rightarrow *R$

$L \rightarrow id$

$R \rightarrow L.$

Is this grammar SLR(1)–grammar? Justify your answer. **(14 Marks)**

4 a. Write the algorithm for constructing canonical sets of LR(1) items for grammar G. Apply the above algorithm to compute the canonical sets of LR(1) items for the following grammar

$S \rightarrow CC$

$C \rightarrow eC \mid d.$ **(14 Marks)**

b. Compare the relative merits and demerits of LALR, SLR and LR(1). **(06 Marks)**

PART - B

5 a. What are syntax directed definitions (SDDs) and syntax directed translation schemes (SDTs)? With suitable example, explain what are synthesized attributes and inherited attributes. **(08 Marks)**

b. Give the SDDs and SDTs for parser STACK implementation of desk calculator and explain its working on the input 3 + 4 * 5n. (Assume grammar with + and * operations) Also write its annotated parse tree. **(12 Marks)**

6 a. What are three address codes? Discuss its quadruples, triples and indirect triples representations. **(06 Marks)**

b. Consider the assignment statement
$a = b * -c + b * -c$. Write the sequence of three address codes and give its quadruple, triple and indirect triple representations. **(08 Marks)**

c. Write the syntax directed definition to build the three address code for an assignment statement 'S' using suitable attributes. **(06 Marks)**

7 a. With neat sketch explain the runtime storage allocation scheme for C++ language on the operating system LINUX. **(08 Marks)**

b. Write a short notes on the following terms :
i) Heap allocation
ii) Garbage collection
iii) Displays. **(12 Marks)**

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

b. Write the code generator algorithm and explain with suitable example. **(10 Marks)**

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