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06IS662

Sixth Semester B.E. Degree Examination, June 2012
Complier Design

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Explain the various phases of a complier? Show the translation for an assignment statement. Position = initial + rate ∗ 60; clearly indicate the output of each phase. **(12 Marks)**

b. Define regular expression definition. Write a regular expression definition for unsigned numbers. Also write the transition diagram. **(08 Marks)**

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

b. For the following grammar

$E \rightarrow TE'$
$E' \rightarrow + TE' \mid E$
$T \rightarrow FT'$
$T' \rightarrow * FT' \mid E$
$F \rightarrow (E) \mid id.$ **(14 Marks)**

Perform predictive LL(1) Parser and also Parse the input string id + id ∗ id.

3 a. What is handle and handle pruning? Show the working of a shift reduce parser for accepting $id_1 + id_2 * id_3$ considering the grammer.

$E \rightarrow E + E \mid E * E \mid (E) \mid id.$ **(08 Marks)**

b. Consider the grammar

$S \rightarrow L = R \mid R$
$L \rightarrow * R \mid id$
$R \rightarrow L$

verify the grammar is SLR (1) or not. **(12 Marks)**

4 a. Write the algorithm for constructing canonical set of LR(1) iterms for grammar G. **(04 Marks)**

b. Apply the above algorithm to compute the connonical sets of LR(1) items for the following grammar

$S \rightarrow CC$
$C \rightarrow a\ C \mid d$ **(10 Marks)**

For the above obtained items construct the parsing table. **(06 Marks)**

PART – B

5 a. Define synthesized and inherited attributes. Give examples for each. **(06 Marks)**

b. For the following CFG write the SDD

$S \rightarrow EN$
$E \rightarrow E + T \mid E - T \mid T$
$T \rightarrow T * F \mid T \mid F \mid F$
$F \rightarrow (E) \mid digit$
$N \rightarrow ;$ **(07 Marks)**

c. Construct the annotated parse tree for the string 5 ∗ 6 + 7; for the SDD given in Q5(b). **(07 Marks)**

6 a. Define DAG. Construct a DAG for the expression.

$a + a * (b - c) + (b - c) * d$. **(06 Marks)**

b. What are three address code? Discuss its quadruples, triples and indirect triples representations. **(06 Marks)**

c. Consider the assignment statement

$a = b * - c + b * - c$.

Write the sequence of three address cods and give its quadruple, triple and indirect triple representations. **(08 Marks)**

7 a. Discuss the general structure of activation record. **(08 Marks)**

b. What is meant by calling sequence and return sequence? List calling sequence design principles. **(08 Marks)**

c. Write a note on garbage collection. **(04 Marks)**

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

b. With an example, explain the common sub expression and dead code elimination methods. **(10 Marks)**

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