C 58399 (Pages : 2) Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2009

Computer Science

CS 04 605—COMPILER DESIGN

Time : Three Hours Maximum : 100 Marks

Answer **all** *questions.*

1. (a) Name the different phases of a compiler.

   (b) Construct a NFA for the regular expression $(a/b)*abb\,(a/b)*$.

   (c) Explain the role of parser in a compiler.

   (d) What is left factoring ? What is the problem created by left factors ? How is it eliminated ?

   (e) Distinguish between Synthesized Attributes and Inherited Attributes.

   (f) Write the translation scheme for checking the type of the identifier in arithmetic expression.

   (g) Write the translation scheme for declarations in a procedure.

   (h) What is meant by common subexpressions ? How is optimization done when common subexpressions occur ?

   (8 × 5 = 40 marks)

2. (a) Construct a minimum-state DFA for the regular expression $(a/b)^*\ a\ (a/b)$. (15 marks)

   Or

   (b) (i) Write notes on a lexical analyzer generator. (8 marks)

   (ii) Explain the steps involved in recognition of tokens taking few grammar examples. (7 marks)

3. (a) Construct the canonical collection of sets of LR (1) items for the grammar :

   $S \rightarrow Aa\,Ab \mid BbBa$

   $A \rightarrow \in$

   $B \rightarrow \in$

   Or

   (b) Construct a predictive parsing table for the grammar :

   $S \rightarrow a\,BDh$

   $B \rightarrow cC$

   $C \rightarrow bC/\in$

   $D \rightarrow EF$

   $E \rightarrow g/\in$

   $F \rightarrow f/\in$

Turn over

4. (a) Write and explain the algorithm for Bottom-up-parsing and translation with inherited attributes.

Or

(b) Explain the stack storage allocation strategy with example.

5. (a) Write the syntax-directed definition to produce three-address code for Boolean expression and explain it with suitable example.

Or

(b) Give a brief explanation on the process of data-flow-analysis.

(4 × 15 = 60 marks)