C 27589

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Name.....

Reg. No.....

SIXTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, JUNE 2003

CS. 2K. 605/IT. 2K. 606-D—COMPILER DESIGN

Time : Three Hours

Maximum : 100 Ma

Answer **all** *questions.*

I. (a) Explain Bootstrapping with suitable example.

(b) Compare the limitations and capabilities of regular expressions and context fr grammar.

(c) Write short notes on Recursive Descent Parser.

(d) Explain the advantages of S-attributed grammar over L-attributed grammar wi suitable example.

(e) Explain the various Intermediate (code) languages used in Compiler Design.

(f) Explain about flow graphs.

(g) Explain the common sub-expression elimination with an example.

(h) Explain how the activation record is used during a procedure call/return.

(8 × 5 = 40 marks

II. (A) Construct NFA and then optimized DFA for the following regular expression :—

$ab\,(a/b)^*\,a^*$.

(15 marks)

Or

(B) (i) Show that the following grammar is ambiguous :—

$E \rightarrow E + E \mid E * E \mid id.$

Give an equivalent unambiguous grammar.

(ii) Define Context free grammar and explain with example how context free grammar defines a language. (8 marks)

III. (A) (i) What is the condition that a given grammar is LL (1) ? (7 marks)

(ii) Compute the FIRST and FOLLOW set for the following grammar :— (7 marks)

$S \rightarrow AaAb \mid BbBa$

$A \rightarrow \varepsilon$

$A \rightarrow \varepsilon.$

Or

(8 marks)

Turn over

(B) Verify whether or not the following grammar is SLR (1) by constructing the parsing table :—

$S \rightarrow Ab \mid B$
$A \rightarrow aB$
$B \rightarrow aA \mid a$

(15 marks)

IV. (A) (i) Write a syntax directed translation scheme for generating intermediate codes for a given Boolean expression containing the operators

AND, OR and NOT.

(10 marks)

(ii) Write a note on the translation in top-down parsing. (5 marks)

Or

(B) (i) Give a suitable run time organization for a block structured language.

(10 marks)

(ii) Give the structure of Activation Record. (5 marks)

V. (A) Explain the loop optimization strategies possible. (15 marks)

Or

(B) Give the concept of next use information and their significance in code generation.

(15 marks)