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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1458 Roll No.

M. C. A.

(SEM. IV) EXAMINATION, 2006-07

COMPILER DESIGN

Time : 3 Hours] *[Total Marks : 100*

Note : *Attempt **all** questions.*

1 Attempt any **four** of the following : **5×4=20**

(a) Expain the working of compiler drawing its block diagram.

(b) Discuss the merits and demerits of Single Pass and Multi Pass Compiler.

(c) Explain why code optization is called optional phase.

(d) Discuss the aspects of high level languages which make them preferable over machine language.

(e) Discuss two compiler writing tools.

2 Attempt any **four** of the following : **5×4=20**

(a) Discuss the schemes for error detection and recovery in each phase of compiler.

(b) How can NFA be generated from regular expression. Explain all the steps.

(c) Consider the following grammar :

$E \rightarrow E + E$

$E \rightarrow E * E$

$E \rightarrow (E)$

$E \rightarrow id$

Using the above grammer, for input string $id_1 + id_2 * id_3$ show the stack implementation for shift reduce parsing.

(d) Regular expression (a a*)/ (b b*) is given. Construct NFA for the expression and convert this NFA to DFA.

(e) Define the following :

(i) Regular grammer

(ii) Context free grammer

(iii) Context sensitive grammer.

3 Attempt any **four** of the following : **5×4=20**

(a) For a context free grammer, production are given as follows :

$S \rightarrow AB$

$A \rightarrow aAb/ab$

$B \rightarrow cBd/cd$

Write down the language accepted by these production.

(b) For the following grammer with S as starting symbol find FIRST and FOLLOW sets of each of the non terminal

$S \rightarrow a \in B/bA/\in$

$A \rightarrow aAb/\in$

$B \rightarrow bB/\in$

(c) What is operator precedence grammer using the operator precedence parsing algorithm construct parse for the string
id + id * id

(d) Consider the grammer :

$S \rightarrow iCt\ SS'/a$

$S' \rightarrow eS/\in$

$C \rightarrow b$

Construct Predictive parsing table for the above grammer.

(e) How parsing techniques are classified?

4 Attempt any **four** of the following : **5×4=20**

(a) Define the following terms :

(i) Induction variable

(ii) Global data flow analysis.

(b) What is LR parser? How it is different from SLR?

(c) Construct LALR table for

$S \rightarrow S$

$S \rightarrow aAd/bBd/aBc/bAc$

(d) Construct the GOTO graph of

$S' \rightarrow S$

$S \rightarrow cC$

$S \rightarrow cC/d$

(e) What do you mean by DAG? Explain the algorithm for constructing a DAG with the help of example.

5 Attempt any **four** of the following : **5×4=20**

(a) Describe the types of errors occurring in different phases of compiler.

(b) How error recovery is alone in LR parsing?

(c) Discuss various popular code optimization techniques.

(d) How registers are allocated in code generation?

(e) Differentiate among source code, intermediate code and object code.
