

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

PAPER ID: 1074

Roll No.

--	--	--	--	--	--	--	--	--	--

B.Tech.

FIFTH SEMESTER EXAMINATION, 2006-07

COMPILER DESIGN

Time : 3 Hours

Total Marks : 100

- Note :**
- (i) Attempt **ALL** questions.
 - (ii) All questions carry equal marks.
 - (iii) In case of numerical problems assume data wherever not provided.
 - (iv) Be precise in your answer.

1. Attempt **any four** parts of the following : (5×4=20)

- (a) Discuss the role of compiler-writing tools. Describe various compiler writing tools.
- (b) Describe the technique used for reducing number of passes.
- (c) Discuss the role of Macros in programming languages.
- (d) Discuss the aspects of high level languages which make them preferable to machine or assembly language.
- (e) Describe basic structure of compiler.

2. Attempt *any two* parts of the following : (10x2=20)

- (a) How lexical analyser removes white spaces from a source file ? Explain the buffer input scheme for scanning the source program.
- (b) Develop an algorithm to simulate an NFA reading an input string. What is time and space complexity of your algorithm as a function of size and length of the input string.
- (c) How is finite automata useful for lexical analysis ? Show that the following regular expressions are same by constructing optimized DFA :

(i) $(a/b)^*$ (ii) $(a^*/b)^*$ (iii) $(a/b^*)^*$

3. Attempt *any two* parts of the following : (10x2=20)

- (a) What do you understand by left factoring and how it is eliminated ?
- (b) Consider the following grammar :

$E \rightarrow T + E \mid T$

$T \rightarrow V * T \mid V$

$V \rightarrow \text{id}$

Write down the procedures for the non terminals of the grammar to make a recursive descent parser.

- (c) Discuss the role of data flow analysis.

4. Attempt *any two* parts of the following : (10x2=20)

- (a) Translate the following program fragment into three address code -

int i ;

i = 1

while a < 10 do

if $x > y$ then $a = x + y$

else $a = x - y$

- (b) Construct LL(1) parsing table for the following grammar :

$S \rightarrow A$

$A \rightarrow aB \mid aC \mid Ad \mid Ae$

$B \rightarrow bBc \mid f$

$c \rightarrow g$

- (c) Discuss the important data structures which are used in implementing symbol table.

5. Write short notes on *any two* of the following sections : (10x2=20)

- (a) Principal sources of optimization
(b) Problems in code generation
(c) Error recovery schemes

- o O o -