

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

PAPER ID : 2476

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

COMPILER DESIGN

Time : 3 Hours

Total Marks : 100

Note : Attempt *all* questions. All questions carry equal marks.

1. Attempt any *four* of the following :
 - (a) Explain the basic structure of compiler.
 - (b) Describe various compiler writing tools.
 - (c) Discuss the utility of MACRO.
 - (d) How bootstrapping is done on more than one machine ?
 - (e) Discuss merits and demerits of single pass compiler and multipass compiler.
 - (f) Discuss the implementation of look ahead operator while doing lexical analysis.

2. Attempt any *four* of the following :
 - (a) Is it possible to design a compiler without a distinct lexical analysis phase ?
 - (b) Explain the rules for construction of the denoted languages alongwith the regular expression construction rules.
 - (c) What language is generated by following grammar ? In each case justify your answer :
 - (i) $s \rightarrow 0s1 \mid 01$
 - (ii) $s \rightarrow +ss \mid -ss \mid a$
 - (iii) $s \rightarrow s(s) s \mid \epsilon$

(d) Discuss input buffering and preliminary scanning in lexical analysis.

(e) Construct minimum state DFA for the following regular expression :

$(a | b)^* a (a | b)$.

(f) What is meant by ambiguous grammar ? How ambiguity is avoided ?

3. Attempt any *two* of the following :

(a) What do you mean by left factoring ? Explain with the help of example how left factoring can be avoided.

(b) Explain how stack implementation of shift reduce parsing is done considering the following grammar :

$E \rightarrow E + E$

$E \rightarrow E * E$

$E \rightarrow (E)$

$E \rightarrow id$

and input string is $id_1 + id_2 * id_3$.

(c) Discuss the role of syntax directed translation scheme.

4. Attempt any *two* of the following :

(a) Consider the following grammar :

$S' = S \#$

$S \rightarrow ABC$

$A \rightarrow a | bb D$

$B \rightarrow a | \epsilon$

$C \rightarrow b | \epsilon$

$D \rightarrow c | \epsilon$

construct the first and follow sets for the grammar, also design a LL(1) parsing table for the grammar.

(b) Explain the working of operator precedence parsing technique with the help of example.

(c) Give three address code for the following :

int i,

i = 1

while a < 10 do

if x > y then

a = x + y

else

a = x - y

5. Write short notes any *two* of the following :

(a) Local and loop optimization

(b) Induction variable elimination

(c) Errors occurring in different phases of compilers.