

Printed Pages—3

ECS603

(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) $s \rightarrow s(s) s \mid \epsilon$

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- (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.