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ECS603

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PAPER ID : 2476	Roll No.		T	T				1			

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 :

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- (i) $s \rightarrow 0s1 \mid 01$
- (ii) $s \rightarrow +ss | -ss | a$
- (iii) $s \rightarrow s(s) s \in$

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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 # $S \rightarrow ABC$ $A \rightarrow a \mid bb D$ $B \rightarrow a \mid \epsilon$ $C \rightarrow b \mid \epsilon$ $D \rightarrow c \mid \epsilon$

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

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- (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.

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