Code No: 09A60504 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

B. Tech III Year II Semester Examinations, June-2014

COMPILER DESIGN

(Computer Science and Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any five questions

All questions carry equal marks

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1.(a) Describe the languages denoted by the following regular expressions.
i. (0+1)* 0 (0+1)*
ii. 0*10*10*10*

(b) What is LEX? Explain, in detail, different sections of LEX program.

(c) What is bootstrapping compiler. Explain it.

2.(a) What is Top down parsing? Explain preprocessing steps required for predictive parsing.

(b) What is an LL(1) grammar? When the grammar is said to be LL(1) grammar? Verify whether the following grammar is LL(1) or not ?

$E \rightarrow E + T \mid T$
$T \rightarrow T^* F \mid F$
$F \rightarrow F \mid a \mid b$

3.(a) What is ambiguous grammar? Eliminate ambiguities for the grammar:
$E \rightarrow E + E \mid E - E \mid (E) \mid id$

(b) Design LALR(1) parser for the following grammar?
$S \rightarrow aAd \mid bBd \mid aBc \mid bAc$
$A \rightarrow e$
$B \rightarrow e$

4.(a) Draw syntax tree for the arithmetic expressions
a * (b + c) – d / 2
Also write the given expression in postfix notation.

(b) Write the quadruple, triple for the following expression
(x + y) * (y + z) + (x + y + z)

(c) Write about S-attributed and L-attributed grammars.

5. Suggest suitable data structures for representing the symbol table for a block structured programming language. Explain how various operations on symbol table are carried out in that data structure. Analyze the complexity of the operations.

6.(a) Explain peephole optimization with examples.

(b) Explain in brief about the DAG based local Optimization.

7.(a) Generate the flow-graphs for the following expressions:

S→ id : = E | S; S | if E then S else S | do S while E

E→ id + id | id

(b) Mention data-flow equations for reaching definitions for the above expressions.

8.(a) Explain the register allocation and assignment generic code generation algorithms.

(b) What are the applications of DAG's

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