Code No: 56031 **R09**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, February/March - 2022
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) Enlist the properties of compiler. What is the role of regular expressions in lexical analyzer.
b) Explain in brief about the types of lexical errors with example. [8+7]

2.a) Construct the predictive parser for the following grammar
$S \rightarrow (L) \mid a$
$L \rightarrow L,S \mid S$
Design the behavior of the parser on the sentence (a, a) using the grammar specified above.
b) Explain recursive decent parser with appropriate example. [8+7]

3.a) Construct LALR parsing table for the grammar
$S \rightarrow Aa \mid bAc \mid dc \mid bda$
$A \rightarrow d$
Parse the input string *bdc* using table generated by you.
b) What is dangling else problem? Discuss the computing of LR(0) items for the same. How a conflict gets resolved during parsing? [7+8]

4.a) Compare different implementation of three address code.
b) Write syntax directed definition and evaluate $9 * 3 + 2$ with parser stack using LR parser method. [7+8]

5.a) Define symbol table. Describe the structure of entries in symbol table.
b) Compare deep access and shallow access. [8+7]

6.a) Construct Abstract Syntax Tree (AST) and DAG for the following statement.
$x = a * b + c - a * b + d$
b) Optimize the following code using various optimization techniques: [7+8]
i=1; s=0;
for (i=1; i<=3; i++)
for (j=1;j<=3;j++)
c[i][j]=c[i][j] + a[i][j] + b[i][j].

7.a) Explain in brief about function preserving transformations on basic blocks.
b) Explain in brief about Induction variable elimination. [8+7]

8.a) Explain the characteristics of peephole optimization with suitable examples.
b) Give an example to show how DAG is used for register allocation. [8+7]

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