JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year II Semester Examinations, August - 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) What are the advantages of a compiler over an interpreter?
  b) Draw the structure of a compiler and describe various phases in the compilation process mention the output of the following statement: $id_1=id_2+id_3*50$ at each phase.   [5+10]

2.a) Design the LEX program that recognizes the tokens of a C language and returns the token found.
  b) Give the DFA and NFA to accept the strings containing a, b such that the string contains even number of a's and odd number of b's.   [7+8]

3.a) Remove the left recursion for the following grammar and also find FIRSTS and FOLLOWs.
     $E{\rightarrow}E + T \mid T$
     $T{\rightarrow}T * F \mid F$
     $F \rightarrow (E)/id$
  b) Write the steps/algorithm to construct the predictive parser table and explain with an example.   [7+8]

4.a) Construct the Recursive Descent Parser with backtracking for the following grammar:
     $S{\rightarrow}aSbS \mid bSaS \mid \varepsilon$
  b) Compute LR(0) items for the following grammar and construct SLR parser table: [7+8]
     $S{\rightarrow}L=R \mid R$
     $L{\rightarrow} *R \mid id$
     $R{\rightarrow}L$

5.a) Construct the syntax directed definition to convert infix notation into postfix notation.
  b) Describe different ways of implementing intermediate code generation of a three-address statement.   [8+7]

6.a) Explain how an L-attributed grammar is converted into a translation scheme.
  b) Compare and contrast S-Attributed definitions with L-Attributed definitions.   [8+7]

7. How is stack storage allocation strategy different from heap allocation strategy? Describe them mentioning their merits and demerits.   [15]

8. Explain the foundations and basic notations used in data-flow analysis for optimizations with examples.   [15]

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