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Reg No.:_______________ Name:__________________________

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019

Course Code: CS304

Course Name: COMPILER DESIGN

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. Marks

1 Scanning of source code in compilers can be speeded up using input buffering. Explain. (3)

2 Draw the DFA for the regular expression (a | b)* (abb | a+ b). (3)

3 Differentiate leftmost derivation and rightmost derivation. Show an example for each. (3)

4 Find out context free language for the grammar given below: (3)

S -> abB
A -> aaBb | ε
B -> bbAa

PART B

Answer any two full questions, each carries9 marks.

5 a) Explain compiler writing tools. (5)

b) Given a grammar : (4)

S→ (L)|a
L→ L,S | S

(i) Is the grammar ambiguous? Justify

(ii) Give the parse tree for the string (a,((a,a), (a,a)))

6 a) Construct the predictive parsing table for the following grammar: (5)

S -> (L) | a
L -> L,S | S

b) Explain how the regular expressions and finite state automata are used for the specification and recognition of tokens? (4)

7 a) Explain the working of different phases of a compiler. Illustrate with a source language statement. (5)

b) Can recursive descent parsers used for left recursive grammars? Justify your answer. Give the steps in elimination of left recursion in a grammar. (4)

PART C

Answer all questions, each carries3 marks.

8 Compute FIRST and FOLLOW for the grammar: (3)

S -> SS+ | SS* | a

9 Write the algorithm to construct LR(1) collection for a grammar. (3)

10 What is an SDD? Show an example. (3)

11 Distinguish between synthesized and inherited attributes. (3)

PART D

Answer any two full questions, each carries9 marks.

12 a) Write algorithm for SLR paring table construction. (5)

b) Construct syntax directed translation scheme for infix to postfix translation. (4)

13 a) Construct the SLR table for the grammar: (5)

S -> aSbS | a

b) Give the annotated parse tree for the expression: 1*2*3*(4+5) **n** (4)

14 a) Differentiate CLR and LALR parsers. (4)

b) Explain the specification of a simple type checker. (5)

PART E

Answer any four full questions, each carries10 marks.

15 a) Explain how DAGs help in intermediate code generation? (4)

b) Explain the code generation algorithm. Illustrate with an example. (6)

16 a) Define the following and show an example for each. (6)

i). Three-address code iii). Triples
ii). Quadruples iv). Indirect triples

b) State the issues in design of a code generator. (4)

17 a) Explain different stack allocation strategies with suitable examples. (10)

18 a) Explain different code optimization techniques available in local and global optimizations? (10)

19 a) How is storage organization and management done during runtime? (4)

b) How the optimization of basic blocks is done by a compiler? (6)

20 a) Write the algorithm for partitioning a sequence of three-address instructions into basic blocks. (4)

b) Construct the DAG and three address code for the expression a+a*(b-c)+(b-c)*d (6)