R20 Regulation *Subject code: 3P5FC*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech V Semester Supplementary Examinations, June/July 2023

COMPILER DESIGN

(INFORMATION TECHNOLOGY)

Maximum Marks: 70 Date:06.07.2023 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10x2M=20 Marks)

1 What is Lexical Analysis?
2 Define DFA.
3 What is an ambiguous grammar? Give example.
4 List the properties of LR parser.
5 What is a syntax tree? Draw the syntax tree for the assignment statement a := b * -c + b * -c.
6 What is a three address code?
7 Mention the applications of DAGs.
8 List Dynamic Storage allocation techniques.
9 What is partial redundancy?
10 Name the techniques in Loop optimization.

Part-B

Answer All the following questions. (10MX 5=50Marks)

11 What are the various phases of a compiler? Explain each phase in detail by using the input "a=(b+c)*(b+c)*2". (10)

OR

12 a. Describe the Input buffering techniques in detail. (5)
b. Elaborate in detail the recognition of tokens. (5)

13 Construct Parsing table for the grammar and find moves made by predictive parser on input id + id * id and find FIRST and FOLLOW. (10)
E -> E + T
E -> T
T -> T * F
T -> F
F -> (E)
F-> id

OR

14 Consider the grammar given below. (10)

E -> E + T
E -> T
T -> T * F
T -> F
F -> (E)
F-> id

Construct an LR parsing table for the above grammar. Give the moves of LR parser on id*id+id

15 a. Discuss in detail about the Syntax Directed Definitions. (5)
b. Construct a syntax directed definition for constructing a syntax tree for assignment statements (5)

S -> id: = E
E -> E1 + E2
E -> E1 * E2
E -> - E1
E -> (E1)
E -> id

OR

16 Generate an intermediate code for the following code segment with the required syntax-directed translation scheme. (10)

if (a > b)
x = a + b
else
x = a – b

17 Discuss the various storage allocation strategies in detail. (10)

OR

18 a. What are the issues in design of a code generator? Explain in detail. (5)
b. Explain in the DAG representation of the basic blocks with example. (5)

19 Explain the principle sources of code optimization in detail. (10)

OR

20 a. Discuss in detail about data flow analysis. (5)
b. Explain loops in flow graphs with examples. (5)