



R20 Regulation

Subject code: 3P5FC

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

## B.Tech V Semester Supplementary Examinations, July 2024

### COMPILER DESIGN

(IT)

Maximum Marks: 70

Date:26.07.2024 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.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A		CO	Bloom Tx
All the following questions carry equal marks (10X2M=20 Marks)			
1	How applications of compiler technology improve levels of abstraction in the generation of programming languages?	CO1	L1
2	Define Regular expression.	CO1	L1
3	What is operator precedence grammar? Give an example.	CO2	L1
4	Define Parser generator.	CO2	L1
5	What are the benefits of intermediate code generation?	CO3	L1
6	What is back patching.	CO3	L1
7	Write the Peephole Optimization?	CO4	L1
8	How can you identify the leader in a Basic block?	CO4	L1
9	What is dead-code elimination.	CO5	L1
10	List the loops in Flow Graphs.	CO5	L1
Part-B			Bloom Tx level
Answer All the following questions. (5X10M=50Marks)			
11	a) 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. b) What is Lexical Analysis and explain Lexical-Analyzer Generator Lex with suitable example. [5+5]	CO1	L2 L2
OR			
12	a) How to specify the Tokens? Differentiate Token, Lexeme and Pattern with suitable examples. b) Develop the structure of a compiler and explain various phases in the compilation process. Mention the output of the following statement: id1=id2+id3*50 at each phase. [5+5]	CO1	L2 L2
13	a) Solve the SLR parsing table for the given grammar: $E \rightarrow E+E \mid E * E \mid (E) \mid id$ and parse the sentence $(a+b)*c$ .	CO2	L3 L2

	b) Define Ambiguous Grammar? Check whether the grammar $S \rightarrow aAB,$ $A \rightarrow bC/cd,$ $C \rightarrow cd,$ $B \rightarrow c/d$ Is Ambiguous or not? [5+5]		
	OR		
14	a) Explain in brief about model of LR parser. b) Remove the left recursion for the following grammar and also find FIRSTS and FOLLOWS. $E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E)/id$ [5+5]	CO2	L2  L2
15	a) Explain about syntax directed translation of Boolean expressions with and without back patching. b) Explain type checking and type conversions with examples. [5+5]	CO3	L2 L2
	OR		
16	a) Construct a Quadruple, Triple and Indirect triple for the statement $a + a * (b - c) + (b - c) * d.$ b) Show that inherited attributes differing from synthesized attributes? [5+5]	CO3	L3 L2
17	a) Summarize trace-based collection. b) How is stack storage allocation strategy different from heap allocation strategy? Describe them mentioning their merits and demerits. [5+5]	CO4	L2 L1
	OR		
18	Construct basic blocks, data flow graph for the following: [10] <pre>for (i = 1 to n) { j = 1; while (j &lt;= n) { A = B * C/D; j = j + 1; }}</pre>	CO4	L4
19	Explain in brief about different Principal sources of optimization techniques with suitable examples. [10]	CO5	L2
	OR		
20	Explain Data-Flow Analysis and elaborate foundations of Data-Flow Analysis. [10]	CO5	L2