b.	Discuss in detail about predictive parser with an example.	10	3	2	1
28. a.	Construct operator precedence relation table for the following grammar: $E \rightarrow E+T/T$ $T \rightarrow T*F/F$ $F \rightarrow (E)/id$ And parse the input string: $id+id$	10	3	3	2
	(OR)				
b.	With neat sketch, neatly explain the SLR parser with an example.	10	3	3	1
29. a.	What are the various methods of implementing 3-address statements? Explain with examples.	10	2	4	1
	(OR)				
b.	List and explain the various attributes of syntax directed translation scheme.	10	2	4	1
30. a.	Explain how the peephole optimization improves the target code.	10	2	5	1
	(OR)				
b.	Describe register allocation and assignment.	10	2	5	1

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Reg. No.															

B.Tech. DEGREE EXAMINATION, MAY 2022

Sixth Semester

18EEE336T – COMPILER DESIGN

(For the candidates admitted from the academic year 2018-2019 to 2019-2020)

Note:

(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B** should be answered in answer booklet.

Time: 2½ Hours Max. Marks: 75

		Marks	BL	CO	PO
	PART – A (25 × 1 = 25 Marks) Answer **ALL** Questions				
1.	Which type of grammar is used in the lexical analysis phase? (A) Regular grammar (B) Context free grammar (C) Context-sensitive grammar (D) Unrestricted grammar	1	1	1	1
2.	In which of the following phase of the compiler is lexical analyser? (A) Second (B) Third (C) First (D) Fourth	1	1	1	1
3.	Keywords are recognized in a compiler during the _____ (A) Code generation (B) Data flow analysis (C) Lexical analysis (D) Program parsing	1	1	1	1
4.	Consider the production of the grammar $S \rightarrow AA, A \rightarrow aa, A \rightarrow bb$. Describe the language (A) $L=\{aaaa, aabb, bbaa, bbbb\}$ (B) $L=\{abab, abaa, aaab, baaa\}$ (C) $L=\{aaab, baba, bbaa, bbbb\}$ (D) $L=\{aaaa, abab, bbaa, aaab\}$	1	2	1	1
5.	DFA is an abbreviation of (A) Non deterministic finite set automata (B) Deterministic finite automata (C) Non deterministic finite automata (D) Deterministic finite set automata	1	1	1	1
6.	Parsing is categorized into how many types? (A) Three (B) Four (C) Two (D) Five	1	2	1	1
7.	Which of the following derivation does a top-down parser use while parsing an input string? (A) Leftmost derivation (B) Leftmost derivation in reverse (C) Rightmost derivation (D) Rightmost derivation in reverse	1	1	2	1

8. Which phase of the compiler is also known as parser? 1 1 2 1
(A) Code optimization (B) Semantic analysis
(C) Syntax analysis (D) Lexical analysis

9. Which grammar gives multiple parse trees for the same string 1 2 2 1
(A) Unambiguous (B) Regular
(C) Ambiguous (D) Syntactic grammar

10. Predictive parser is 1 1 2 1
(A) LL(1) parser (B) LR(1) parser
(C) LL(0) parser (D) LR(0) parser

11. A bottom-up parser generate 1 2 3 1
(A) Left-most derivation in reverse (B) Left-most derivation
(C) Right-most derivation in reverse (D) Right-most derivation

12. Which phenomenon happens when the non-terminal on the left side is repeated as the first symbol on the right side? 1 2 3 1
(A) Left-most derivation (B) Left recursion
(C) Left factoring (D) Left parsing

13. The bottom-up parsing method is also called 1 1 3 1
(A) Shift reduce parsing (B) Predictive parsing
(C) Recursive descent parsing (D) SLR parsing

14. Ambiguities in the grammar yields 1 2 3 1
(A) More than two parse trees (B) More than one parse tree
(C) Only one parse tree (D) No parse tree

15. Which component given below is important for semantic analysis 1 1 3 1
(A) Y_{acc} (B) L_{ex}
(C) Symbol table (D) Type checking

16. In which of the following tree, the leaf indicates the operand and interior nodes represents operator? 1 1 4 1
(A) Syntax tree (B) Parser tree
(C) Structured tree (D) Semantic tree

17. Which mapping is described by the implementation of the syntax-directed translator? 1 1 4 1
(A) Parse table (B) Input
(C) Output (D) Input-output

18. Which of these structure has four fields? 1 1 4 1
(A) Parse tree (B) Triples
(C) Indirect triples (D) Quadruples

19. Which of the following is used in various stages or phases of the compiler? 1 2 4 1
(A) Records (B) Program
(C) Symbol table (D) Table

20. Which of the statement is an abstract form of intermediate code? 1 1 4 1
(A) 3-address (B) 2-address
(C) Address (D) Intermediate code

21. Code generation can be considered as the _____ phase of compilation. 1 1 5 1
(A) First (B) Second
(C) Third (D) Final

22. $\frac{x}{2}$ can be replaced by $x >> 1$ and it is an example of 1 2 5 2
(A) Algebraic expression simplification (B) Accessing machine instructions
(C) Strength reduction (D) Code generator

23. Peephole optimization is a 1 2 5 1
(A) Loop optimization (B) Local optimization
(C) Constant folding (D) Data flow analysis

24. Which algorithm invokes a function GETREG( )? 1 2 5 1
(A) Code motion algorithm (B) Code optimization algorithm
(C) Intermediate code (D) Code generation algorithm

25. Substitution of values for names whose values are constant, is done in 1 2 5 1
(A) Local optimization (B) Loop optimization
(C) Constant folding (D) Strength reduction

PART – B (5 × 10 = 50 Marks) Marks BL CO PO
Answer **ALL** Questions

26. a. Describe the different phases of a compiler with an example $d = p * n * r / 100$. 10 2 1 2

(OR)

b. For the following expression, find the minimized DFA: 10 3 1 2
$a(a/b)*b$

27. a.i. Remove the left factoring in the following: 5 3 2 2
$A \rightarrow aAB / aBc / aAc$

ii. Consider the following grammar and eliminate left-recursion: 5 3 2 2
$S \rightarrow (L) / a$
$L \rightarrow L_1 S / S$

(OR)