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B.Tech. DEGREE EXAMINATION, MAY 2023

Sixth Semester

18EEE336T - COMPILER DESIGN

(For the candidates admitted during the academic year 2018-2019 to 2021-2022)

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 40 minutes.

ii. **Part - B** and **Part - C** should be answered in answer booklet.

Time: 3 Hours **Max. Marks: 100**

Part - A (20 × 1 Marks = 20 Marks)

Answer **All** Questions

		Marks	BL	CO
1.	What is a compiler? (A) system program that converts instructions to machine language (B) system program that converts machine language to high-level language (C) system program that writes instructions to perform (D) None of the mentioned	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
3.	Keywords are recognized in a compiler during (A) The code generation (B) The data flow analysis (C) The lexical analysis (D) The program parsing	1	1	1
4.	Consider the production of the grammar S->AA A->aa A->bb Describe the language specified by the production grammar. (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	1	2
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	2
6.	Parsing is categorized into how many types? (A) Three types (B) Four types (C) Two types (D) Five types	1	1	2
7.	Which of the following derivations 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
8.	Which phase of the compiler is also known as Parser? (A) Code Optimization (B) Semantic Analysis (C) Syntax Analysis (D) Lexical Analysis	1	1	3
9.	Find the grammar gives multiple parse trees for the same string (A) Unambiguous (B) Regular (C) Ambiguous (D) Syntactic Grammar	1	1	3

10.	Which of the following grammar rules violate the requirements of an operator grammar? (i) P -> QR (ii) P ->QsR (iii) P -> ε (iV) P ->QtRr (A) (i) only (B) (i) and (iii) only (C) (ii) and (iii) only (D) (iii) and (iv) only	1	1	3
11.	A bottom-up parser generates (A) Left-most derivation in reverse (B) Left-most derivation (C) Right-most derivation in reverse (D) Right –most derivation	1	1	4
12.	Which phenomenon happens when the non-terminal on the left side is repeated as the first symbol on the right side? (A) Left-most derivation (B) Left recursion (C) Left factoring (D) Left parsing	1	1	4
13.	The bottom-up parsing method is also called (A) Shift reduce parsing (B) Predictive parsing (C) Recursive descent parsing (D) SLR Parsing	1	1	4
14.	Which of the following parser is a top-down parser? (A) An LALR parser (B) A LR parser (C) Operator precedence parser (D) Recursive descent parser	1	1	4
15.	Choose the component important for semantic analysis (A) Yacc (B) Lex (C) Symbol Table (D) Type Checking	1	1	5
16.	In which of the following tree, the leaf indicates the operand, and the interior node represents the operator. (A) Syntax tree (B) Parser tree (C) Structured tree (D) Sematic tree	1	1	5
17.	Which mapping is described by the implementation of the syntax-directed translator? (A) Parse table (B) Input (C) Output (D) Input-Output	1	1	5
18.	Choose the structure has four fields (A) Parse tree (B) Triples (C) Indirect Triples (D) Quadruples	1	1	6
19.	Which of the following is used in various stages or phases of the compiler? (A) Records (B) Program (C) Symbol Table (D) Table	1	1	6
20.	Determine the statement is an abstract form of intermediate code (A) 3- address (B) 2- address (C) address (D) Intermediate code	1	1	6

Part - B (5 × 4 Marks = 20 Marks)

Answer **any 5** Questions

		Marks	BL	CO
21.	Differentiate between compiler and interpreter.	4	1	1
22.	Define the following terms: a) Lexeme b) Token.	4	1	1
23.	With examples discuss about left recursion and left factoring.	4	1	2
24.	Define left most derivation and right most derivation with examples.	4	1	3
25.	What is a DAG? Mention its applications.	4	1	4

26.	What are the induction variables?	4	1	5
27.	Explain about code motion.	4	1	6

Part - C (5 × 12 Marks = 60 Marks)

Answer **All** Questions

		Marks	BL	CO
28.	a. Demonstrate the process of compilation. Illustrate the output of each phase of compilation for the input a = (b+c) *(b+c) * 2. (OR) b. For the following expression find the minimized DFA: a^+b / b^+a.	12	1	1
29.	a. i. Remove the Left Factoring in the following: A → aAB / aBc / aAc. ii. Consider the following grammar and eliminate left recursion- S → (L) / a L → L , S / S (OR) b. Discuss in detail about Predictive parser with an example.	12	1	3
30.	a. Construct Operator precedence relation table for the following grammar: E àE + T / T T àT * F / F F à (E) / id and parse the input string: id + id (OR) b. Neatly Explain the SLR parser with an example.	12	1	4
31.	a. What are the various methods of implementing 3-address statements? Explain with examples? (OR) b. List and explain the attributes of Syntax Directed Translation Scheme.	12	1	5
32.	a. Narrate the characteristic of Peephole Optimization. (OR) b. Enumerate Basic Blocks and Flow Graphs.	12	1	6

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