Test

Compiler Design

Time: 45 min.

Directions for questions 1 to 30: Select the correct alternative from the given choices.

1. The most powerful parsing method is
   (A) LALR (B) LR
   (C) CLR (D) LL (1)

2. In which phase 'type checking' is done?
   (A) Lexical analysis
   (B) Code optimization
   (C) Syntax analysis
   (D) Semantic analysis

3. A shift reduces parser carries out the actions specified within braces immediately after reducing the corresponding rule of grammar, as below:
   $S \rightarrow aaD$ {Print "1"}.
   $S \rightarrow b$ {Print "2"}
   $D \rightarrow Sc$ {Print "3"}
   What is the translation of 'aaaabcc' using the syntax directed translation scheme described by the above rules?
   (A) 33211 (B) 11233
   (C) 11231 (D) 23131

4. $E \rightarrow TE'$
   $E' \rightarrow +\ TE'/\in$
   $T \rightarrow FT'$
   $T' \rightarrow *FT'/\in$
   $F \rightarrow (E)/id$
   From above grammar, FOLLOW (E) is
   (A) {), $} (B) {$, *)}
   (C) {(, id} (D) {+,), $}

5. To eliminate backtracking, which one is used?
   (A) Left Recursion
   (B) Left Factoring
   (C) Right Recursion
   (D) Right Factoring

6. Consider the grammar
   $T \rightarrow (T) \mid \in$
   Let the number of states in SLR (1), LR (1) and LALR (1) parsers for the grammar be n_1, n_2 and n_3 respectively. Which relationship holds well?
   (A) $n_1 = n_2 = n_3$
   (B) $n_1 \geq n_3 \geq n_2$
   (C) $n_1 = n_3 < n_2$
   (D) $n_1 < n_2 < n_3$

7. If w is a string of terminals and A, B are two non-terminals then which of the following are left-linear grammars?
   (A) $A \rightarrow wB/w$
   (B) $A \rightarrow Bw/w$
   (C) $A \rightarrow wB$
   (D) None of the above

8. The grammar $E \rightarrow E * E/E + E/a$, is
   (A) Ambiguous
   (B) Unambiguous
   (C) Will not depend on the given sentence
   (D) None of these

9. Shift-reduce parsers are
   (A) Bottom up parsers
   (B) Top down parsers
   (C) Both (A) and (B)
   (D) None of these

10. Consider the following grammars:
    I. $E \rightarrow TE'$
       $E' \rightarrow +\ TE'/\in$
       $T \rightarrow FT'$
       $T' \rightarrow *FT'/\in$
       $F \rightarrow (E)/id$
    II. $S \rightarrow iCtSS' \mid a$
       $S' \rightarrow eS \mid \in$
       $C \rightarrow b$
    Which of the following is true?
    (A) II is LL (1) (B) I is LL (1)
    (C) Both (A) and (B) (D) None of these

11. Consider the following grammar:
    $S \rightarrow iCtSS'/a$
    $S' \rightarrow eS/\in$
    $C \rightarrow b$
    First (S') is
    (A) $\{i, a\}$ (B) $\{\$, e\}$
    (C) $\{e, \in\}$ (D) $\{b\}$

12. From the above grammar Follow(S) is.
    (A) $\{\$, e\}$ (B) $\{\$\}$
    (C) $\{e\}$ (D) {$,), e}

13. Find the LEADING (S) from the following grammar:
    $S \rightarrow a \mid \wedge \mid (T)$
    $T \rightarrow T, S / S$
    (A) {a, ^, (} (B) {, a,)}
    (C) {, a, (} (D) {, a, ^,)}

14. From above grammar find the TRAILING (T).
    (A) {a,)} (B) {a, ^,)}
    (C) {),} (D) {, a,)}

15. Which of the following remarks logically follows?
    (A) FIRST ($\in$) = {$\in$}.
    (B) If FOLLOW (A) contains $, then A may or may not be the start symbol.
    (C) If A → w, is a production in the given grammar G, then $FIRST_k$ (A) contains $FIRST_k$ (w).
    (D) All of the above

16. Consider the following grammar:
$S \rightarrow AB$
$B \rightarrow ab$
$A \rightarrow aa$
$A \rightarrow a$
$B \rightarrow b$.
The grammar is
(A) Ambiguous
(B) Unambiguous
(C) Can't predictable
(D) None of these

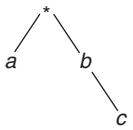
17. If a handle has been found but there is no production with this handle as a right side, then we discover
(A) Logical error
(B) Runtime error
(C) Syntactic error
(D) All of the above

18. The function of syntax phase is
(A) To build a literal table
(B) To build an uniform symbol table
(C) To parse the tokens produced by lexical analyzer
(D) None of these

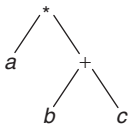
19. Which of the following are cousins of compilers?
(A) Pre-processor and Assembler
(B) Assembler and LEX
(C) Pre-processor and YACC
(D) LEX and YACC.

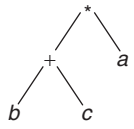
20. Error is detected in predictive parsing when ____ hold(s).
(i) 'a' on top of stack and next input symbol is 'b'.
(ii) When 'a' is on top of stack, 'a' is next input symbol and parsing table entry $M[A, a]$ is empty.
(A) Neither (i) nor (ii)
(B) Both (i) and (ii)
(C) only (i)
(D) only (ii)

21. Which one indicates abstract syntax tree (AST) of "$a * b + c$" with following grammar:
$E \rightarrow E * T/T$
$T \rightarrow T + F/F$
$F \rightarrow id$

(A) 

(B) 

(C) 

(D) 

22. The parse tree is constructed and then it is traversed and the semantic rules are evaluated in a particular order by a
(A) Recursive evaluator
(B) Bottom up translation
(C) Top down translation
(D) Phase tree method

23. The following grammar indicates
$S \rightarrow a\ \alpha\ b|b\ \alpha\ c|a\ b$
$S \rightarrow \alpha\ S\ |b$
$S \rightarrow \alpha\ b\ b/a\ b$
$S \rightarrow \alpha\ b\ d\ b/b$
(A) LR (0) grammar
(B) SLR grammar
(C) Regular grammar
(D) None of these

24. If the attributes of the child depends on the attributes of the parent node then it is ____ attribute.
(A) Inherited
(B) Directed
(C) Synthesised
(D) TAC

25. The semantic rule is evaluated and the intermediate code is generated when the production is expanded in ____
(A) Parse tree method
(B) Bottom up translation
(C) Top down translation
(D) Recursive evaluator model

26. Consider the grammar shown below:
$S \rightarrow CC$
$C \rightarrow cC/a$
The grammar is
(A) LL (1)
(B) SLR (1) But not LL (1)
(C) LALR (1) but not SLR (1)
(D) LR (1) but not LALR

27. The class of grammars for which we can construct predictive parsers looking k-symbols ahead in the input is called
(A) LR (k)
(B) CLR (k)
(C) LALR (k)
(D) LL (k)

28. A compiler is a program that
(A) Places programs into memory and prepares them for execution.
(B) Automates the translation of assembly language into machine language.
(C) Accepts a program written in a high level language and produces an object program.
(D) Appears to execute a source program as if it were machine language.

Common data for questions 29 and 30:

Consider the grammar
$E \rightarrow TE'$
$E' \rightarrow + TE' \mid \in$
$T \rightarrow FT'$
$T' \rightarrow * FT' \mid \in$
$F \rightarrow (E) \mid id.$

29. Which one is FOLLOW (F)?
(A) {+,), $}
(B) {+, (,), *}
(C) {*,), $}
(D) {+, *,), $}

30. FIRST (E) will be as same as
(A) FIRST (T)
(B) FIRST (F)
(C) Both (A) and (B)
(D) None of these

Answers Keys

1. A	**2.** D	**3.** D	**4.** A	**5.** B	**6.** C	**7.** B	**8.** A	**9.** A	**10.** B
11. C	**12.** A	**13.** A	**14.** C	**15.** D	**16.** A	**17.** C	**18.** C	**19.** A	**20.** B
21. C	**22.** A	**23.** D	**24.** A	**25.** C	**26.** A	**27.** D	**28.** C	**29.** D	**30.** C