

1. Mark each statement true or false (2 points each, 20 cents)
- 1) A LR(1) parser cannot parse any left-recursive CFG without ambiguity. (F)
- 2) LL(1) grammar cannot be left-recursive. (T)
- 3) Given a legal string of tokens for a CFG, there must be a unique parsing tree to derive the string. (F)
- 4) The language $L = \{a^n b^n \mid n \geq 1\}$ can't be generated by any regular expression. (T)
- 5) There is only one parse tree for the string of an unambiguous grammar. (T)
- 6) If a grammar is LR(1), but not LALR(1). There may be shift-reduce conflicts in its parsing table of LALR(1). (F)
- 7) Finding the next handle is the main task of a LR parser. (T)
- 8) Both DFA and NFA can recognize regular set. (T)
- 9) The parse tree will completely reflect the derivation steps for a string. (F)
- 10) Left recursion is commonly used to make operations left associative. (T)
2. Multiple Choice (3 points each, 30 cents)
- 1) Given the CFG: $E' \rightarrow E, E \rightarrow E + n \mid n$, _____ is(are) the viable prefix(es) of the right sentential form ' $n+n$ '. (ACD)
- [A] n [B] n+ [C] E [D] E+
- 2) If a LL(1) grammar contains the rules: $A \rightarrow \alpha_1 \mid \alpha_2; B \rightarrow \beta_1 \mid \beta_2$, then the following condition _____ must be satisfied. (AD)
- [A] $\text{First}(\beta_1) \cap \text{First}(\beta_2)$ is empty [B] $\text{First}(B) \cap \text{Follow}(A)$ is empty
- [C] $\text{First}(A) \cap \text{Follow}(A)$ is empty [D] $\text{First}(\alpha_1) \cap \text{First}(\alpha_2)$ is empty
- 3) Given the production $A \rightarrow B a C$, we have _____. (B)
- [A] $\text{Follow}(C) \subset \text{Follow}(A)$, $\text{First}(B) \subset \text{First}(A)$ [B] $\text{Follow}(A) \subset \text{Follow}(C)$, $\text{First}(B) \subset \text{First}(A)$
- [C] $\text{Follow}(C) \subset \text{Follow}(A)$, $\text{First}(A) \subset \text{First}(B)$ [D] $\text{Follow}(A) \subset \text{Follow}(C)$, $\text{First}(A) \subset \text{First}(B)$
- 4) Given the grammar rules: $A' \rightarrow A, A \rightarrow (A) A \mid \epsilon$ and the rightmost derivation $A' \Rightarrow A \Rightarrow (A)A \Rightarrow (A)(A)A \Rightarrow (A)() \Rightarrow ()()$. _____ is the viable prefix the sentential form $(A)(A)$. (B)
- [A] A [B] (A [C] ((A)A)A [D] ()
- 5) Give the LR(1) item $[A \rightarrow \alpha \beta C, a/b]$, we have _____. (C)
- (A) $(a,b) \subset \text{First}(A)$ (B) $(a,b) \subset \text{First}(B)$
- (C) $(a,b) \subset \text{Follow}(A)$ (D) $(a,b) \subset \text{Follow}(B)$
- 6) Here is a grammar: (C)
- $X \rightarrow a \quad X \rightarrow \epsilon \quad Y \rightarrow b \quad Y \rightarrow X$

$Z \rightarrow c \quad Z \rightarrow XYZ \quad W \rightarrow d \quad W \rightarrow XY$

Which symbol is not nullable?

[A]. X [B]. Y [C]. Z [D]. W

7) The parsing method of YACC is _____. (A)

[A] LALR(1) [B] LR(1) [C] SLR(1) [D] LL(1)

8) Which action is not in a LL(1) parsing table? (AD)

[A] Shift [B] Generate [C] Accept [D] Reduce

9) The output of the parser is _____. (B)

[A] token [B] syntax tree [C] target code [D] intermediate code

10) Which one is not related to the LL(1) parsing method. (D)

[A] Left factoring [B] First set and follow set

[C] Remove left recursion [D] Remove right recursion

一、Mark each statement true or false (2 points each, 6 cents)

1. The same language token may be generated by many different regular expressions. (T)
2. To any regular expression, we can find a context-free grammar defining the same language. (T)
3. The LL(1) parsing algorithm parses an input string of tokens by tracing out the steps in a rightmost derivation. (F)

二、Single Choice (1 points each, 5 cents)

1. The concept () is not related to the LL(1) parsing method.

[A] Left-factoring [B]. First set and follow set

[C.] Left recursion removal [D]. Shift and reduce

2. Which one below is not a part of a compiler? (这个题目不是太好，就不扣分了)

[A] Symbol table [B] Assembler

[C] Code optimizer [D] Parser

3. In the production $A \rightarrow B \alpha C$, we have

[A] $\text{Follow}(C) \subset \text{Follow}(A)$, $\text{First}(B) \subset \text{First}(A)$

[B] $\text{Follow}(C) \subset \text{Follow}(A)$, $\text{First}(A) \subset \text{First}(B)$

[C] $\text{Follow}(A) \subset \text{Follow}(C)$, $\text{First}(B) \subset \text{First}(A)$

[D] $\text{Follow}(A) \subset \text{Follow}(C)$, $\text{First}(A) \subset \text{First}(B)$

4. IF one CFG grammar contains two non-terminals 'A','B' and two terminal 'a','b', where

'A' is the start symbol, then the Follow set of 'A' may be ()

[A] {a, b} [B] {a, b, \$} [C] {a, b, ε} [D] {a, b, B}

5. In the Top-Down Parsing, the action () will never be used.

[A] Shift [B] Match [C] Generate [D] Accept

一、Mark each statement true or false (2 points each)

1. A grammar is ambiguous if it has two different derivations or two different parse trees for a sentence.. F
2. If a grammar is LR(l), but not LALR(l). There are not shift-reduce conflicts in its parsing table of LALR(1). T

二、Single Choice (2 points each)

A 1. In the Top-Down Parsing, the action () will never be used.

[A] Shift [B] Match [C] Generate [D] Accept

A 2. In the Top-Down Parsing, the action () will never be used.

[A] Shift [B] Match [C] Generate [D] Accept

B 3. IF one CFG grammar contains two non-terminals 'A','B' and two terminal

'a','b', where 'A' is the start symbol, then the Follow set of 'A' may be

()

[A] {a, b} [B] {a, b, \$} [C] {a, b, ε} [D] {a, b, B}

一、Single Choice (12 cents)

1. which of the following language is generated by the context free grammar G:

$S \rightarrow xSx \mid y$

[A] xyx [B] $(xyx)^*$ [C] $x^n y x^n (n \geq 0)$ [D] $x^* y x^*$

2. If the context-free grammar G is not ambiguous, for any sentence generated by G, which of the following description is correct? _____

[A] the parse tree corresponding to the left-most derivation must be the same to that of the right-most derivation.

[B] the parse tree corresponding to the left-most derivation may not be the same to that of the right-most derivation.

[C] the left-most derivation must be the same to the right-most derivation.

[D] there will be more than one left-most derivation, but the parse tree is the same.

3. If one CFG grammar is LL(1) and contains the rules: $A \rightarrow \alpha_1 \mid \alpha_2; B \rightarrow \beta_1 \mid \beta_2$, then the following condition () must be satisfied.

[A] $\text{First}(A) \cap \text{First}(B)$ is empty [B] $\text{First}(\alpha_1) \cap \text{First}(\alpha_2)$ is empty

[C] $\text{First}(A) \cap \text{Follow}(A)$ is empty [D] $\text{First}(B) \cap \text{Follow}(A)$ is empty

4. LR(1) item $[A \rightarrow \alpha . B \gamma, a]$, follow(B)= { }.

[A] a [B] γ [C] { γ, a } [D] { γa }

5. the parsing method of YACC is ()

[A] LALR(1) [B] LR(1) [C] SLR(1) [D] LL(1)

6. In the Bottom-Up Parsing, the action () will never be used.

[A] Reduce [B] Match [C] Shift [D] Accept

一、Mark each statement true or false (20 cents)

1. Scopes of the variables are intercrossed sometimes.
2. Yacc can not use ambiguous grammars.
3. Both DFA and NFA can recognize regular set.
4. A grammar is ambiguous if it has two different derivations or two different parse trees for a sentence.
5. Grammars with left recursion eliminated are LL(1).
6. All LL(1) grammars can be parsed by LALR parser.
7. Code generation depends on detailed information about the target architecture, and doesn't care the characteristics of the source language.
8. The best choice of data structure of the symbol table is HASH table.
9. An L-value can not occur on the right of an assignment statement.
10. An intermediate representation is a kind of machine language with committing to too much machine-specific detail.

1. Strings over the alphabet {a,b,c} where the length of the string is even can be generated by regular expression ____.

[A]. $((a \mid b \mid c)(a \mid b \mid c))^*$

[B]. $(a \mid b \mid c)(aa \mid bb \mid cc)^*(a \mid b \mid c)$

[C]. $(aa \mid bb \mid cc)^*$

[D]. $(a \mid b \mid c)^*$

2. Which of the following is not only found in a stack frame (activation record)?

[A] static variables

[B] return address

[C] saved registers

[D] parameters

3. The elements in a LR Parsing table are labeled with the following kinds of actions except ____?

[A]. Shift [B]. Goto [C]. Accept [D]. Push

4. In the production $B \rightarrow \alpha A \gamma$, Which would not be in the FOLLOW(A) Set?

[A]. ϵ [B]. FIRST(γ) [C]. FOLLOW(B) [D]. \$

5. Which grammar parser below is the least powerful?

[A]. LL(0) [B]. LR(0) [C]. SLR [D]. LR(1)

6. Here is a grammar:

$X \rightarrow a \quad X \rightarrow \epsilon \quad Y \rightarrow b \quad Y \rightarrow X$

$Z \rightarrow c \quad Z \rightarrow XYZ \quad W \rightarrow d \quad W \rightarrow XY$

Which symbol is not nullable?

[A]. X [B]. Y [C]. Z [D]. W

7. Which element would not appear in the stack of LR parser?

[A]. terminal [B]. nonterminal [C]. \$ [D]. state

8. Normally, we do error recovery with methods except ____?

[A]. add error production [B]. modify the parsing tables

[C]. eliminate the conflict [D]. modify the parsing engine

9. Which of the following is commonly found in a stack frame (activation record)?

[A] fp pointer

[B] sp pointer

[C] static variable

[D] global variable

10. Many compilers are divided into two largely independent passes: a front end, responsible for analyzing source code, and a back end, responsible for generating target code. (They may also include a third, intermediate phase, responsible for code improvement.) What is the most important motivation for this division into passes?

[A] to provide portability of compiler

[B] to facilitate division of labor when a compiler is built by a large team of programmers

[C] to minimize memory requirements on modern machines

[D] to facilitate debugging the compiler

三、Mark each statement true or false (20 cents)

1. (F) 2. (F) 3. (T) 4. (F) 5. (F)

7. (F) 7. (F) 8. (T) 9. (F) 10. (F)

四、Single Choice (15 cents)

1. A 2. A 3. D 4. A 5. A

6. C 7. C 8. C 9. A 10. A

一、 Mark each statement true or false

- 1、Both DFA and NFA can recognize regular set.
- 2、Context free grammar can generate language $L = \{a^n b^n c^m \mid n \geq 0, m \geq 0\}$
- 3、Intermediate Code generation depends on detailed information about the target architecture, and doesn't care the characteristics of the source language.
- 4、A display is a data structure that may be used as a alternative to static links for maintaining access to the variables.
5. A grammar is ambiguous if it has two different derivations for a sentence.
6. In grammar, nullable symbol can only derive the empty string.
7. All LR(0) grammars can be parsed by SLR parser.
8. There might be shift-reduce, shift-shift and reduce-reduce conflicts during the LR parsing.

二、 Single Choice

- 1、 Which of the following string can be defined by the regular expression $((b|c)^* a (b|c)^* a (b|c)^* .)$
- [A] abbcab [B] aaaa [C] abbbbbc [D] bbacc
- 2、 the output of the scanner is:
- [A] token [B] syntax tree [C] target code [D] intermediate code
- 3、 Lex is a tool that ()
- [A] break the source file into individual words, or tokens
- [B] analyze the phrase structure of the program
- [C] is a lexical analyzer generator
- [D] is a parser generator
- 4、 In the following which is(are) not commonly found in a stack frame (activation record)?
- [A] return address [B] static variables
- [C] saved registers [D] arguments
- 5、 which does the operation pushing the return address in the stack frame?
- [A] the caller procedure
- [B] the called procedure
- [C] the operation system
- [D] CPU
6. Which action is not in a LR Parsing table?

- [A] Shift [B] Push [C] Accept [D] Reduce
7. In the production $B \rightarrow \alpha A \gamma$, Which would not be in the FOLLOW(A) Set?
- [A] ϵ [B] FIRST(γ) [C] FOLLOW(B) [D] \$
8. Which element would not appear in the stack of LR parser?
- [A] nonterminal [B] terminal [C] state [D] \$
9. Which grammar parser below is the most powerful?
- [A] LL(1) [B] LR(0) [C] SLR [D] LR(1)
10. the parsing method of YACC is ()
- [A] LALR(1) [B] LR(1) [C] SLR(1) [D] LL(1)

一、 Mark each statement true or false (16 cents) (每题 2 分)

(T) (F) (F) (T) (F) (F) (T) (F)

二、 Single Choice (10 cents) (每题 1 分)

A A C B B B A D D A

1. An LR(1) parser can detect errors earlier than an LR(0) parser.

判断题 (4.0 分) (难度:中)

A. True

B. False

正确答案: A

答案解析: 暂无

2. If a grammar is LR(1), then the LALR(1) parsing table cannot have any reduce-reduce conflicts.

判断题 (4.0 分) (难度:中)

A. True

B. False

正确答案: B

答案解析: 暂无

3. The topological sort of attribute computation of is unique.

判断题 (4.0 分) (难度:中)

A. True

B. False

正确答案: B

答案解析: 暂无

4. An inherited attribute can be calculated by a postorder traversal of the parse tree.

判断题 (4.0 分) (难度:中)

A. True

B. False

正确答案: B

答案解析: 暂无

5. All inherited attributes can be changed into synthesized attributes by suitable modification of the grammar, without changing the language of the grammar.

判断题 (4.0 分) (难度:中)

A. True

B. False

正确答案: A

答案解析: 暂无

6. The input of semantic analysis phase is _____.

单选题 (4.0 分) (难度:中)

A. tokens

B. CFG

C. an abstract syntax tree

D. a parse tree

正确答案: C

5. (15 cents) Consider the following augmented grammar.

$S' \rightarrow S$

$S \rightarrow a|(T)$

$T \rightarrow T, S|S$

(1) Construct the LR(1) DFA. (10 cents) (12 cents)

(2) Is the given left-recursive CFG LR(1)? (3 cents)

7. Given the following declarations:

t1 = array [10] of int;

t2 = array [10] of int;

if t1 and t2 is equivalent, it follows _____ equivalence.

单选题 (4.0 分) (难度:中)

A. structural

B. name

C. declaration

D. none of the above

正确答案: A

答案解析: 暂无

8. When inheriting a previously computed synthesized attribute during LR parsing, it is suitable to treat the computed synthesized attribute as _____.

单选题 (4.0 分) (难度:中)

A. return value

B. passing as parameter

C. external data structure

D. just leaving it on the value stack

正确答案: C

答案解析: 暂无

9. A Yacc-generated parser employ _____ method to parse the input token stream.

单选题 (4.0 分) (难度:中)

A. top-down

B. LL(1)

C. SLR(1)

D. LALR(1)

正确答案: D

答案解析: 暂无

10. The symbol tables will not carry the _____ information about the variables.

单选题 (4.0 分) (难度:中)

A. data type

B. scope

C. liveness

D. location in memory

正确答案: A

