一、Mark each statement *true* or *false*

1、Both DFA and NFA can recognize regular set.

2、Context free grammar can generate language L = {$a^n b^n c^m$ | n >=0 , m>=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→αAγ, 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)

三、Questions

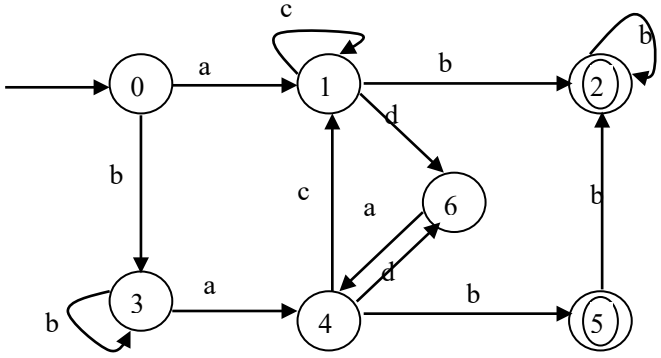
1、 Describe and explain the main translation phases of a compiler. （7 cents）

Answer:

2、Please explain the meaning of the binding {g ↦ string, a↦ int }. (5 cents)Answer:

3、Apply the state minimization algorithm to the following DFA. Then give a regular expression to describe this language. (10 cents)

Answer:



4. Consider the following statement: (10 cents)

if (a>b) x = x-2 else y=y+1

Please use Intermediate Representation Tree to describe the above code.

Answer:

5. Given the grammar

A→ A A

A→ (A)

A→ ε

Drawing two different parsing trees for the string **( )**, showing that it is ambiguous. (7 cents)

Answer:

6. Consider the following grammar (20 cents)

S→A S→B

A→ e A→ f

B→ (C) C→ S D

D→ S D D→

a. Calculate nullable, FIRST and FOLLOW for nonterminals in the grammar.

b. Construct the LL(1) parsing table for the grammar.

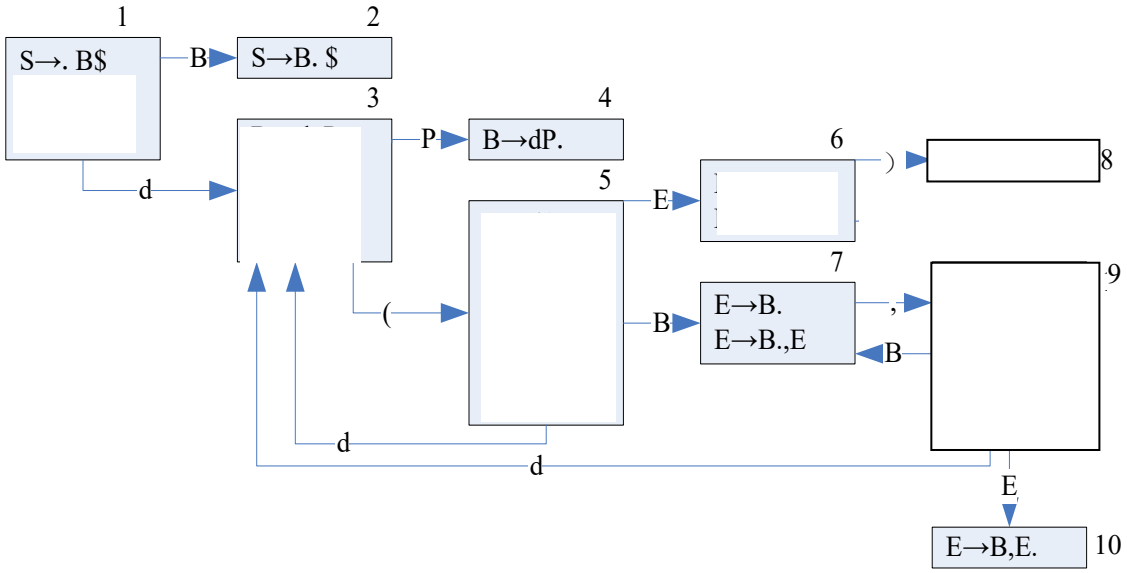
c. Show that the grammar is LL(1).

Answer:

7. Construct the LR(0) states for this grammar, and then determine whether it is an SLR grammar, give the SLR parsing table. (15 cents)

0 S→B $ 1 B→ d P 2 B→ d (E) 3 P→ 4 P→ (E)

5 E→B 6 E→B, E



Answer: