作业3.

$X \to Y_1\ Y_2\ Y_3\ Y_4\ Y_5$

$Y_1 \to a \mid \varepsilon$

$Y_2 \to b \mid \varepsilon$

$Y_3 \to c \mid \varepsilon$

$Y_4 \to d \mid \varepsilon$

$Y_5 \to e \mid \varepsilon$

解: $FIRST(X) = \{a \mid X \Rightarrow^* a\cdots,\ a \in V_T\}$

m) $FIRST(X) = \{a, b, c, d, e, \varepsilon\}$

3.10 解:

$FIRST(D) = \{int, real\}$

$FIRST(T) = \{int, real\}$

$FIRST(L) = \{id\}$

$FIRST(R) = \{,\ ,\ \varepsilon\}$

$FOLLOW(D) = \{\#\}$

$FOLLOW(T) = \{id\}$

$FOLLOW(L) = \{\#\}$

$FOLLOW(R) = \{\#\}$

分析表:

非终结符 \ 输入符号	int	real	id	,	#
D	D→TL	D→TL			
T	T→int	T→real			
L			L→id R		
R				R→,idR	R→ε

3. 12

解：FIRST(S) = { x, d, ε }

FIRST(A) = { x }

FIRST(B) = { b }

FIRST(P) = { d, ε }

FIRST(Q) = { a, ε }

FOLLOW(S) = { # }

FOLLOW(A) = { b }

FOLLOW(B) = { # }

FOLLOW(P) = { a, # }

FOLLOW(Q) = { x }

FIRST(AB) = FIRST(A) = { x }

FIRST(PQx) = { d, a, x }

{ x } ∩ { d, a, x } = { x }

则 该文法不是 LL(1) 文法

3.16 解

(a) $S \Rightarrow_{rm} (L) \Rightarrow_{rm} (L, S) \Rightarrow_{rm} (L, (L)) \Rightarrow_{rm} (L, (L, S))$

$\Rightarrow_{rm} (L, (L, a)) \Rightarrow_{rm} (L, (S, a)) \Rightarrow_{rm} (L, (a, a))$

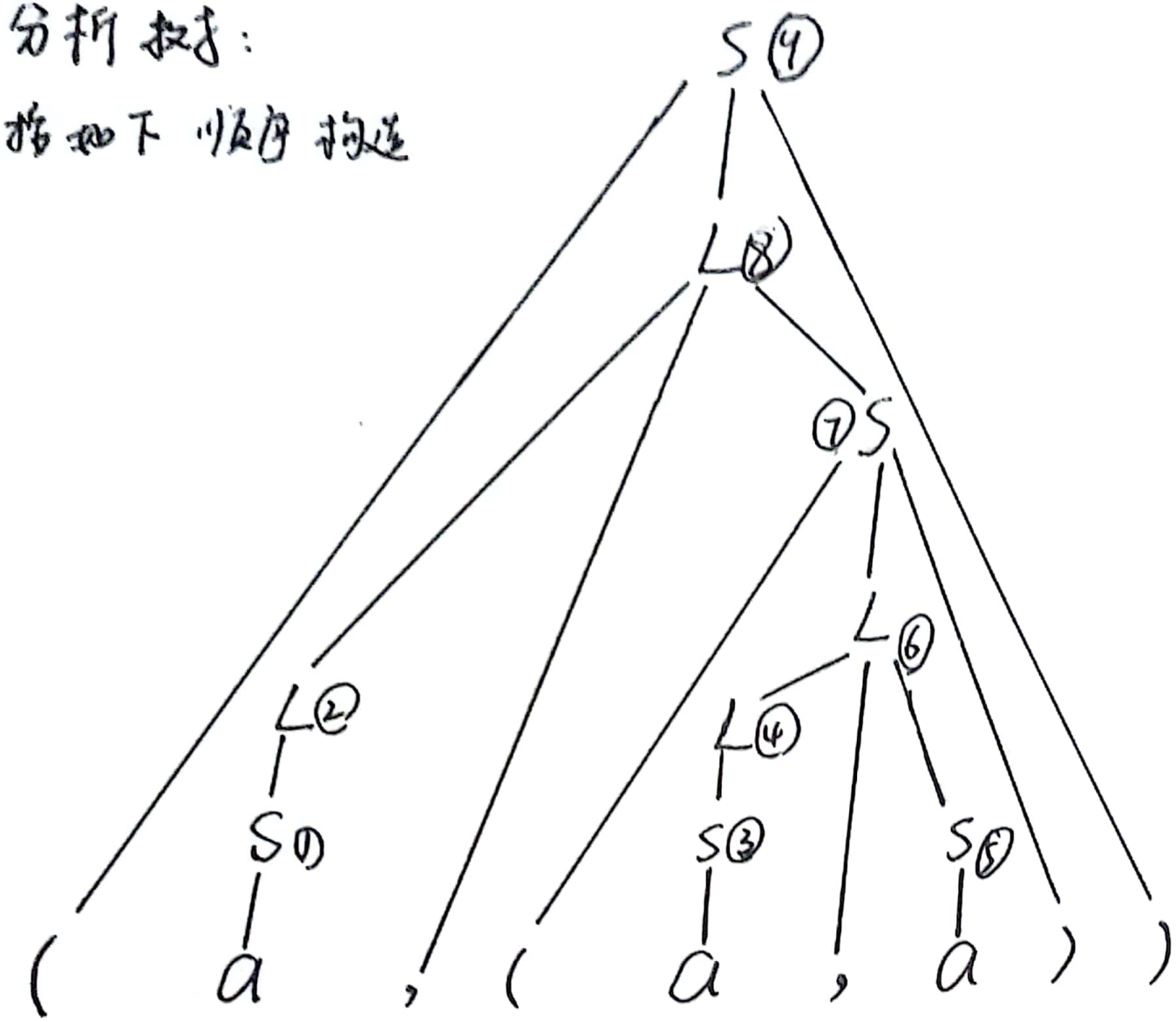
$\Rightarrow_{rm} (S, (a, a)) \Rightarrow_{rm} (a, (a, a))$

(b)

栈	输入	动作
#	(a,(a,a))#	移进
#(	a,(a,a))#	移进
#(a	,(a,a))#	按 $S \to a$ 归约
#(S	,(a,a))#	按 $L \to S$ 归约
#(L	,(a,a))#	移进
#(L,	(a,a))#	移进
#(L,(	a,a))#	移进
#(L,(a	,a))#	按 $S \to a$ 归约
#(L,(S	,a))#	按 $L \to S$ 归约
#(L,(L	,a))#	移进
#(L,(L,	a))#	移进
#(L,(L,a	))#	按 $S \to a$ 归约
#(L,(L,S	))#	按 $L \to L, S$ 归约
#(L,(L	))#	移进
#(L,(L)	)#	按 $S \to (L)$ 归约
#(L,S	)#	按 $L \to L, S$ 归约
#(L	)#	移进
#(L)	#	按 $S \to (L)$ 归约
#S	#	成功接受

(C) 分析树：

按如下顺序构造



2.9 解：

拓广文法

(0) ① $E' \to E$

(1) ② $E \to E+T$

(2) $E \to T$

(3) $T \to TF$

(4) $T \to F$

(5) $F \to F^*$

(6) $F \to a$

(7) $F \to b$

LR(0)项目集规范族：

I_0：$E' \to \cdot E$
$E \to \cdot E+T$
$E \to \cdot T$
$T \to \cdot TF$
$T \to \cdot F$
$F \to \cdot F^*$
$F \to \cdot a$
$F \to \cdot b$

I_1：$E' \to E \cdot$
$E \to E \cdot +T$

I_2：$T \to T \cdot F$
$E \to T \cdot$
$F \to \cdot F^*$
$F \to \cdot a$
$F \to \cdot b$

I_3：$T \to F \cdot$
$F \to F \cdot ^*$

I_4：$F \to a \cdot$

I_5：$F \to b \cdot$

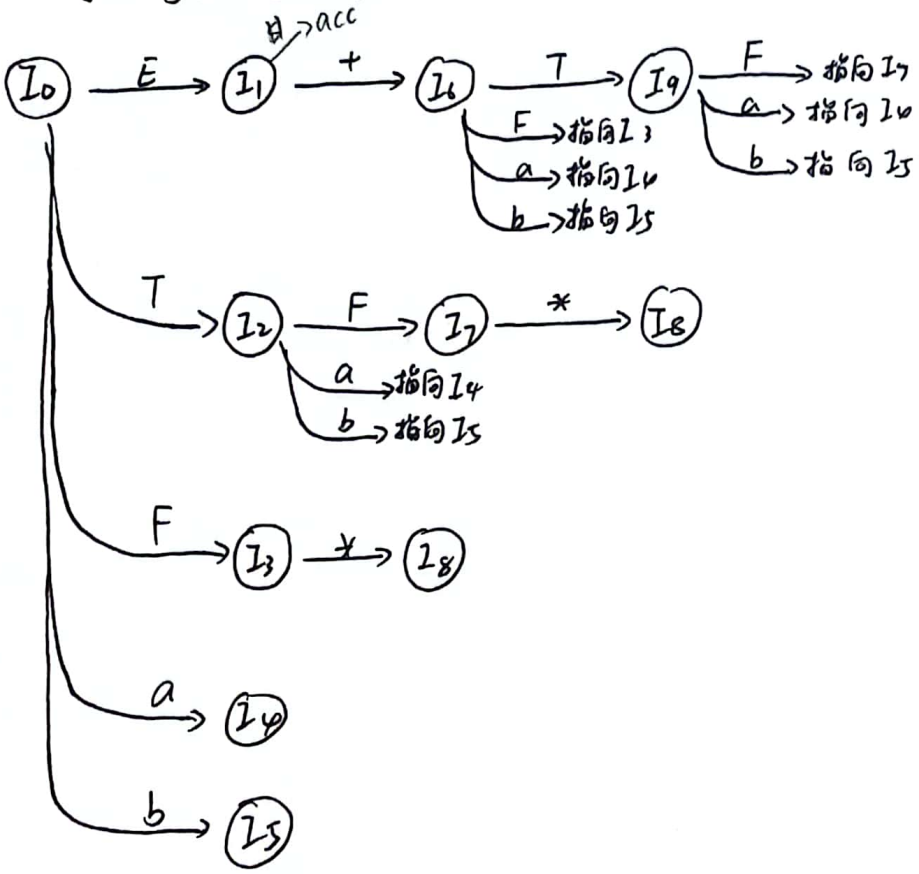
I_6：$E \to E+ \cdot T$
$T \to \cdot TF$
$T \to \cdot F$
$F \to \cdot F^*$
$F \to \cdot a$
$F \to \cdot b$

I_7：$T \to TF \cdot$
$F \to F \cdot ^*$

I_8：$F \to F^* \cdot$

I_9：$E \to E+T \cdot$
$T \to T \cdot F$
$F \to \cdot F^*$
$F \to \cdot a$
$F \to \cdot b$

识别活前缀的DFA：



	FIRST	FOLLOW
E	a, b	#, +
T	a, b	#, +, a, b
F	a, b	#, +, a, b, *

构造 SLR分析表

状态	action					goto		
	+	*	a	b	#	E	T	F
0			S4	S5		1	2	3
1	S6				acc			
2			S4	S5				7
3		S8						
4	r6	r6	r6	r6	r6			
5	r7	r7	r7	r7	r7			
6			S4	S5			9	3
7		S8						
8	r5	r5	r5	r5	r5			
9			S4	S5				7