

2016310436

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1. (a) true

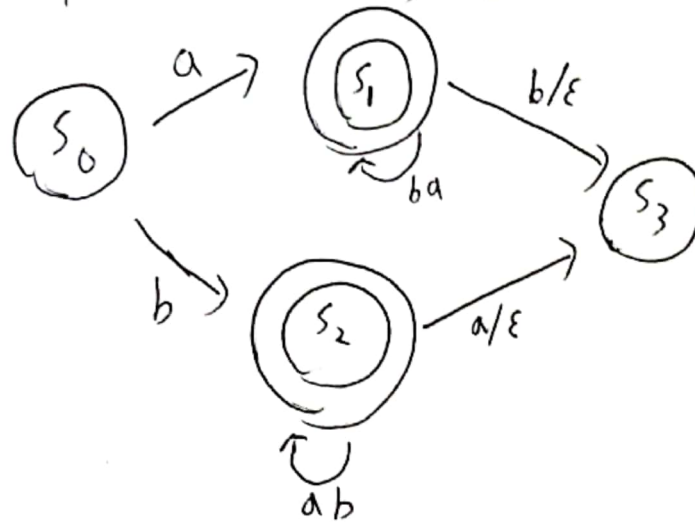
(b) true

(c) false

(d) true

(e) true

2. (A) $\text{Seq}(a, b)$ $\{a, b, ab, ba, aba, \dots\}$ (length lot more)



(B) $\text{Seq}(a, b) = (a(ba)^*(b|\epsilon)) / (b(ab)^*(a|\epsilon))$

3. (A)

$$R \rightarrow abarR'$$

$$| cabarR'$$

$$R' \rightarrow bcR'$$

$$| \epsilon$$

(B)

$$Q \rightarrow bQ'$$

$$Q' \rightarrow bc$$

$$| c$$

$$R \rightarrow R''R'$$

$$| cR''R'$$

$$R'' \rightarrow aR'''$$

$$R''' \rightarrow bR''''$$

$$R'''' \rightarrow a$$

(C)

$$\text{first}(L) = \{c, b, a\} \quad \text{follow}(L) = \{\emptyset\}$$

$$\text{first}(R) = \{c, a\} \quad \text{follow}(R) = \{a\}$$

$$\text{first}(R') = \{b\} \quad \text{follow}(R') = \{a\}$$

$$\text{first}(R'') = \{a\} \quad \text{follow}(R'') = \{b, a\}$$

$$\text{first}(R''') = \{b\} \quad \text{follow}(R''') = \{b, a\}$$

$$\text{first}(R''') = \{a\} \quad \text{follow}(R''') = \{b, a\}$$

$$\text{first}(Q) = \{b\} \quad \text{follow}(Q) = \{b\}$$

$$\text{first}(Q') = \{b, c\} \quad \text{follow}(Q') = \{b\}$$

	c	b	a
L	L → Ra	L → Qba	L → Ra
R	R → cR''R'		R → R''R'
R'		R' → bcR'	
R''			R'' → aR'''
R'''		R''' → bR''''	
R''''			R'''' → a
Q		Q → ba'	
Q'	Q' → c	Q' → bc	

Satisfies LL(1) property

4. (A)

0 $[S \rightarrow \cdot S, eof]$

1 $[S \rightarrow S \cdot, eof]$

0 $[S \rightarrow \cdot A a, eof]$

2 $[S \rightarrow A \cdot a, eof]$

3 $[S \rightarrow A A', eof]$

0 $[A \rightarrow \cdot B C, eof]$ $[A \rightarrow B \cdot, a]$

4 $[A \rightarrow B \cdot C, eof]$ $[A \rightarrow B C \cdot, a]$

5 $[A \rightarrow B C \cdot, eof]$ $[A \rightarrow B C \cdot, a]$

0 $[A \rightarrow \cdot B C f, eof]$ $[A \rightarrow \cdot B C f, a]$

4 $[A \rightarrow B \cdot C f, eof]$ $[A \rightarrow B C \cdot f, a]$

5 $[A \rightarrow B C \cdot f, eof]$ $[A \rightarrow B C f \cdot, a]$

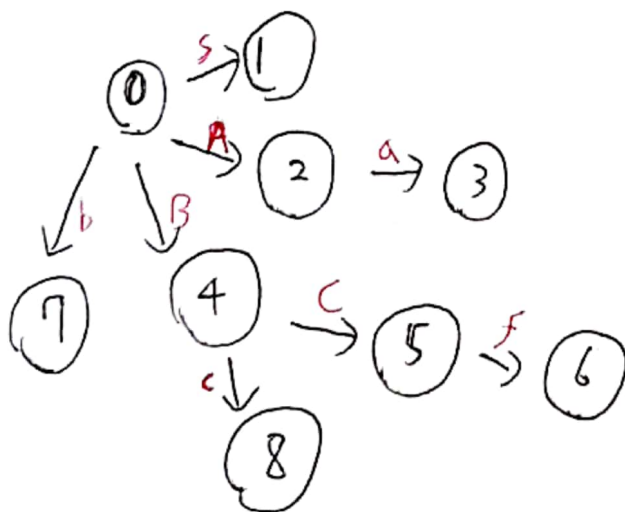
6 $[A \rightarrow B C f \cdot, eof]$ $[A \rightarrow B C f \cdot, a]$

0 $[B \rightarrow \cdot b, eof]$ $[B \rightarrow \cdot b, c]$

7 $[B \rightarrow b \cdot, eof]$ $[B \rightarrow b \cdot, c]$

4 $[C \rightarrow \cdot c, eof]$ $[C \rightarrow \cdot c, a]$ $[C \rightarrow \cdot c, f]$

8 $[C \rightarrow c \cdot, eof]$ $[C \rightarrow c \cdot, a]$ $[C \rightarrow c \cdot, f]$



4. (B)

	Action					GoTo			
	a	b	c	f	eof	S	A	B	C
0		s7				s1	s2	s4	
1					acc				
2	s3								
3					r2				
4			s8						s5
5	r3			s6					
6	r4								
7			r5						
8	r6			r6					

5. (A)

Symbol	attributes
D	$\text{type}(\text{Int}, \text{real}), \text{addtype}(\text{string}, \text{type})$
T	$\text{type}(\text{Int}, \text{real})$
L ₀	$\text{addtype}(\text{string}, \text{type})$

(B)

