

a) Define the parsing table of an LR(1) analyzer for the grammar.

$$S ::= SA^0 | b^1$$

$$A ::= S^2 a$$

$$I_0 = \{ S' \rightarrow \cdot S, S \rightarrow \cdot SA, S \rightarrow \cdot b \} \text{ NC river no reduce item}$$

$$GOTO_0(0, S) = \{ S' \rightarrow S \cdot, S \rightarrow S \cdot A, A \rightarrow \cdot S a, S \rightarrow \cdot SA, S \rightarrow \cdot b \} \text{ NC river } b \notin F_N(S') = \{ \$ \}$$

$$= I_1$$

$$GOTO_0(0, b) = \{ S \rightarrow b \cdot \} \text{ NC river only 1 item}$$

$$= I_2$$

$$GOTO_0(1, A) = \{ S \rightarrow SA \cdot \} \text{ NC river only 1 item}$$

$$= I_3$$

$$GOTO_0(1, S) = \{ A \rightarrow S \cdot a, S \rightarrow S \cdot A, A \rightarrow \cdot S a, S \rightarrow \cdot SA, S \rightarrow \cdot b \}$$

$$= I_4$$

NC river no reduce item

$$GOTO_0(1, b) = I_2$$

$$GOTO_0(4, a) = \{ A \rightarrow S a \cdot \} \text{ NC river only 1 item}$$

$$= I_5$$

$$GOTO_0(4, A) = I_3$$

$$GOTO_0(4, S) = I_4$$

$$GOTO_0(4, b) = I_2$$

	a	b	\$	S	A
0		S/2		1	
1		S/2 acc		4	3
2	R/1	R/1	R/1		
3	R/0	R/0	R/0		
4	S/5	S/2		4	3
5	R/1	R/2	R/2		

$$F_N(S) = \{ \$, a, b \}$$

$$F_N(A) = F(S) = \{ \$, a, b \}$$

c) Use the Parsing Table to recognize "b b a b a a"

d) Compute $COCC(1)$

e) Show the Parsing Table resulting from (d).