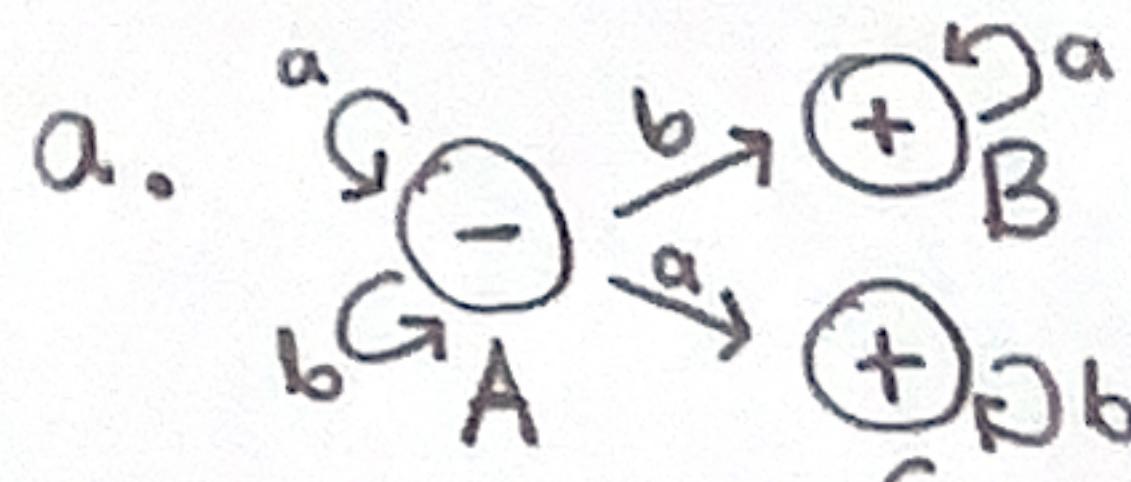


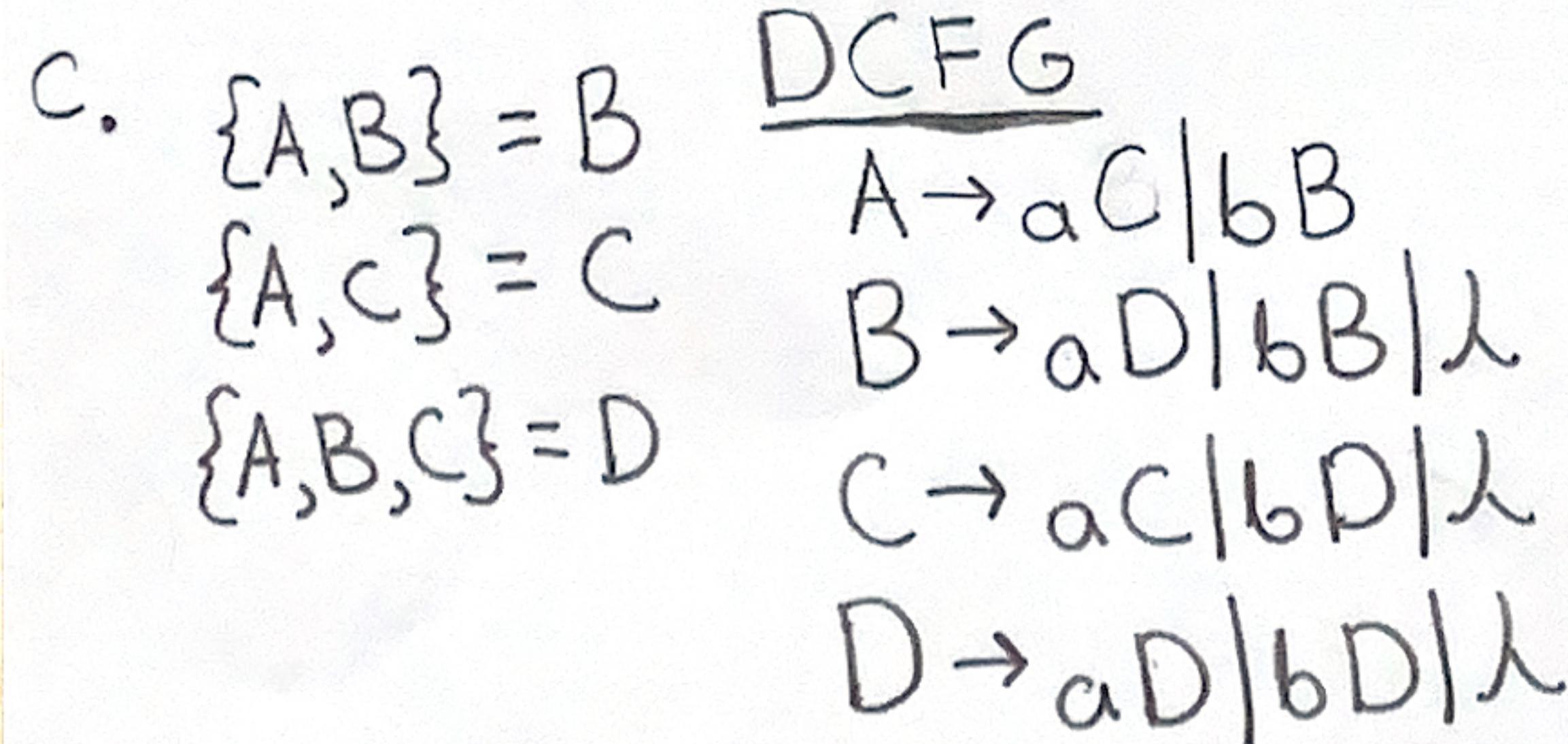
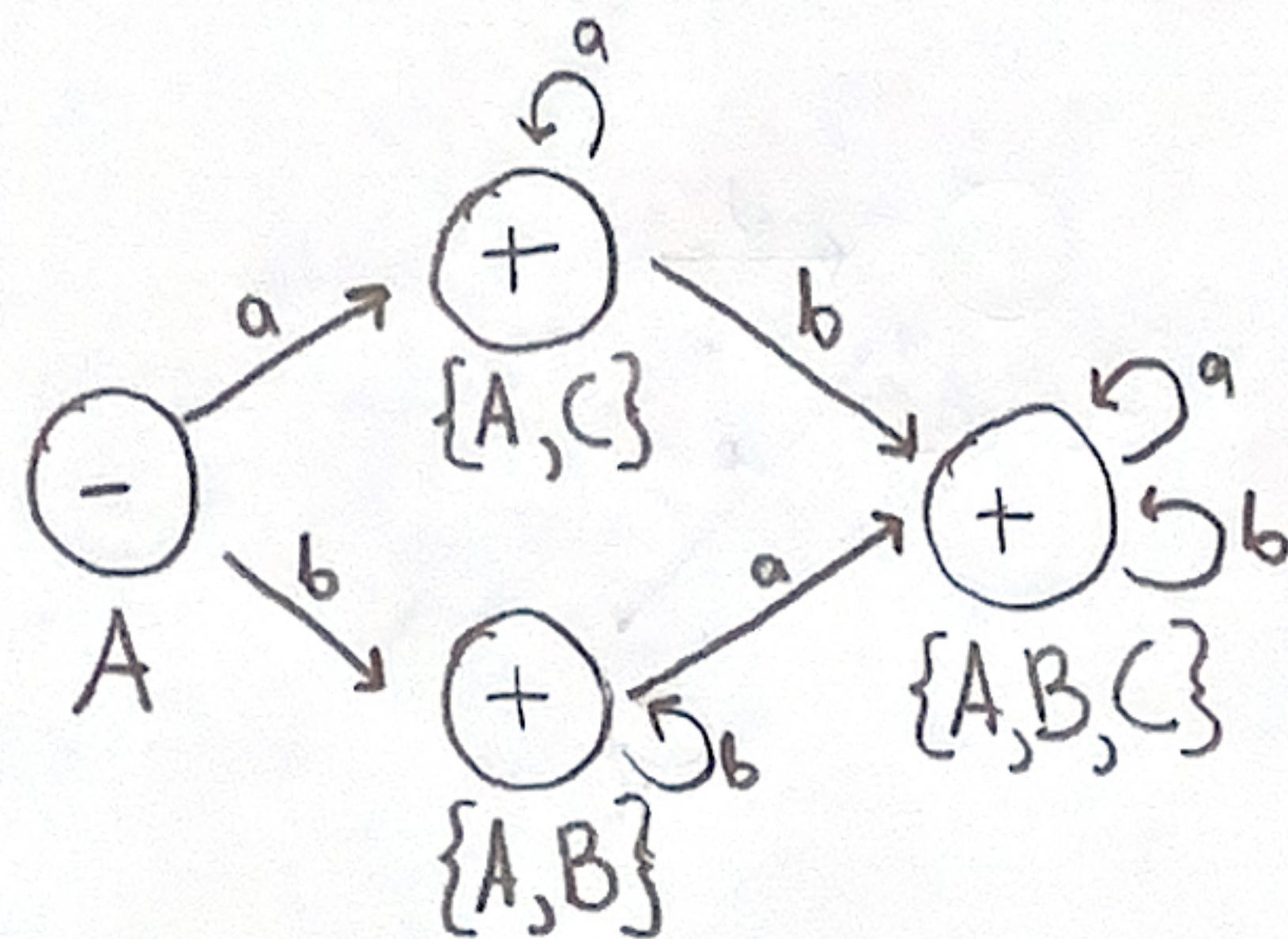
1.

$$L = (a+b)^*(ba^* + ab^*)$$



b.

	a	b
A	{A,C}	{A,B}
B	B	-
C	-	C
<del>mmmmmmmmmm</del>		
{A,C}	{A,C}	{A,B,C}
{A,B}	{A,B,C}	{A,B}
{A,B,C}	{A,B,C}	{A,B,C}



2.

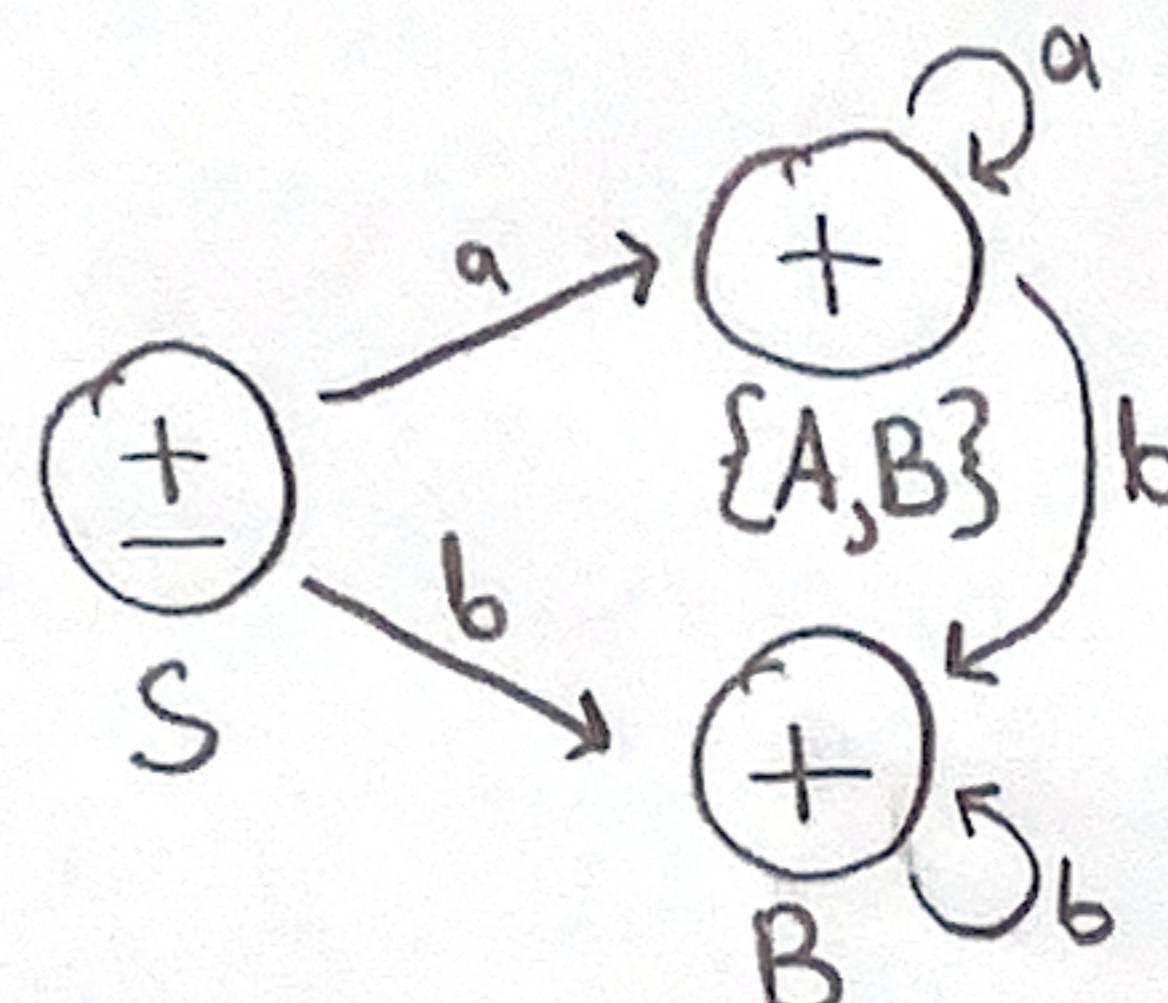
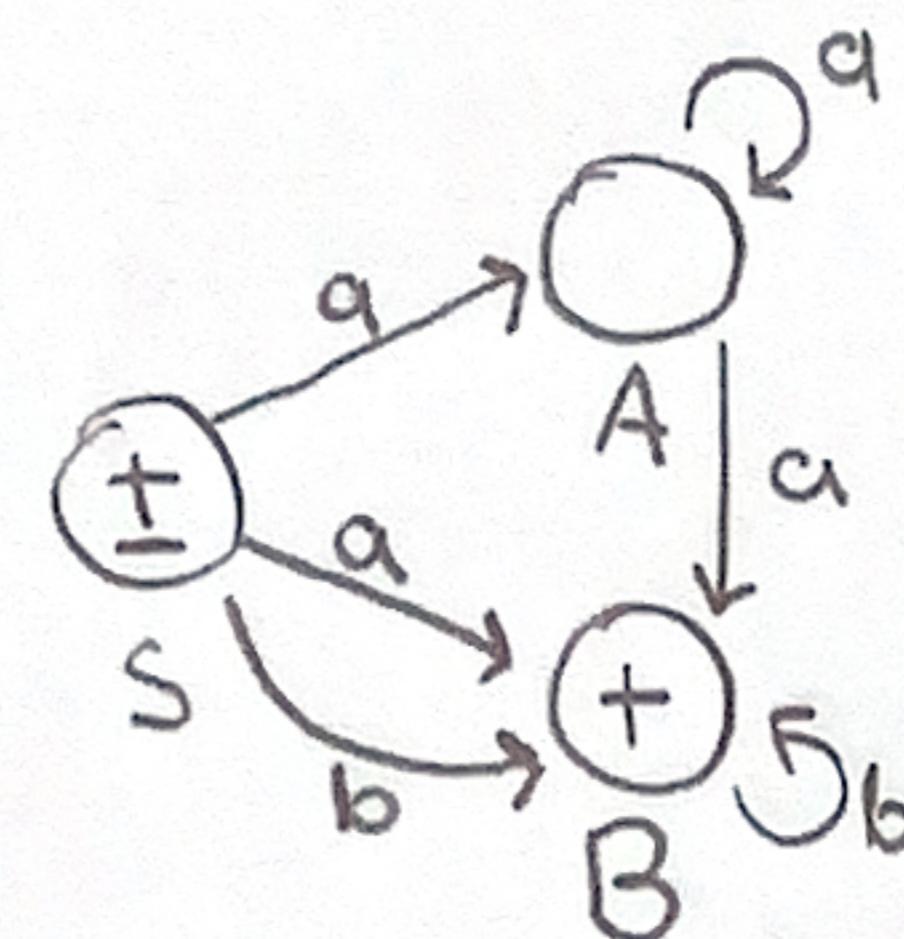
$$S \rightarrow aA | aB | bB | \lambda$$

$$B \rightarrow bB | \lambda$$

$$A \rightarrow aA | aB$$

	a	b
S	$\{A, B\}$	B
A	$\{A, B\}$	-
B	-	B
<hr/>		
$\{A, B\}$	$\{A, B\}$	B

$$\{A, B\} = X$$



DCFG

$$S \rightarrow aX | bB | \lambda$$

$$X \rightarrow aX | bB | \lambda$$

$$B \rightarrow bB | \lambda$$

3.

i.  $L = a^* b(a+b)^*$   
reg. CFG

$$A \rightarrow aA | bB$$

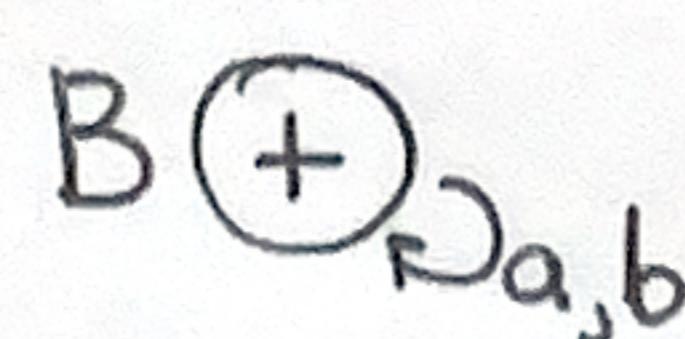
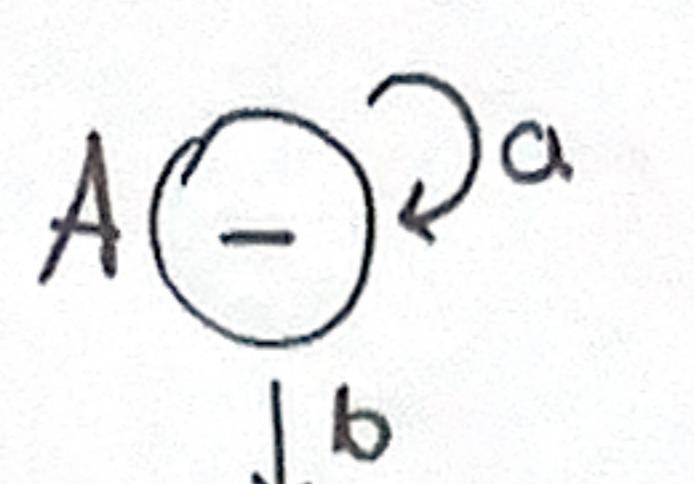
$$B \rightarrow aB | bB | \lambda$$

non-reg. CFG

$$S \rightarrow AbC$$

$$A \rightarrow aA | \lambda$$

$$B \rightarrow aB | bB | \lambda$$

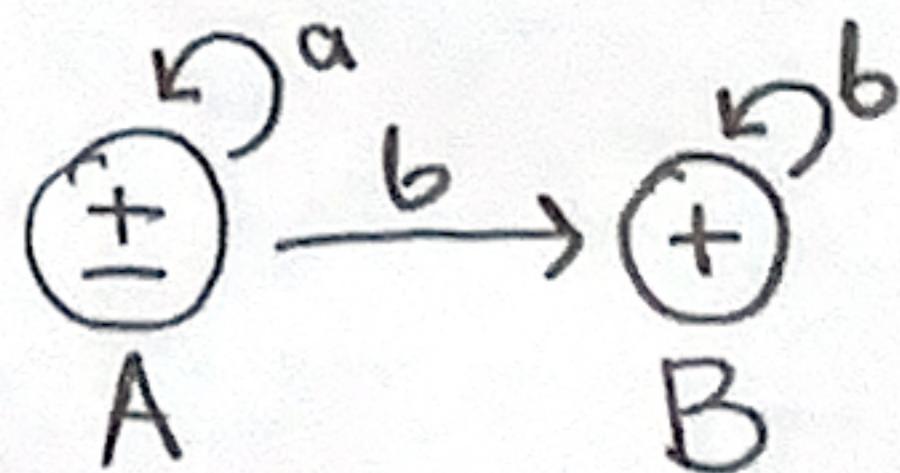


ii  $L = a^* b^*$

reg. CFG

$$A \rightarrow aA | bB | \lambda$$

$$B \rightarrow bB | \lambda$$

non-reg. CFG

$$S \rightarrow AB$$

$$A \rightarrow aA | \lambda$$

$$B \rightarrow bB | \lambda$$

4.

$$a. S \rightarrow [a] \{b\} d$$

$$S \rightarrow A B d$$

$$A \rightarrow a | \lambda$$

$$B \rightarrow b B | \lambda$$

i.  $S \xrightarrow{\boxed{a} \quad \boxed{b}} d \rightarrow$

ii.  $S \rightarrow A B d$

$$A \rightarrow a$$

$$A \rightarrow \lambda$$

$$B \rightarrow b B$$

$$B \rightarrow \lambda$$

$$b. S \rightarrow \{a|b\} \{c\}$$

i.  $S \xrightarrow{\boxed{a} \quad \boxed{b}} \boxed{c} \rightarrow$

ii.  $S \rightarrow A C$

$$A \rightarrow a A$$

$$A \rightarrow b A$$

$$A \rightarrow \lambda$$

$$C \rightarrow c C$$

$$C \rightarrow \lambda$$

$$c. S \rightarrow \{a\} \{b\} [c] \{d\}$$

i.  $S \xrightarrow{\boxed{a} \quad \boxed{b} \quad \boxed{c} \quad \boxed{d}} \rightarrow$

ii.  $S \rightarrow A B C D$

$$A \rightarrow a A$$

$$A \rightarrow \lambda$$

$$B \rightarrow b B$$

$$B \rightarrow \lambda$$

$$C \rightarrow c C$$

$$C \rightarrow \lambda$$

$$D \rightarrow d D$$

$$D \rightarrow \lambda$$