1. Find a context-free grammar that doesn't use lambda that accepts the same language as the following CFG (except for the empty string).

S -> BSA | A

A -> aA | λ

B -> Bba | λ

A->aA|a

B->Bba|ba

S->S|BSA|A|λ

2. Find a grammar that accepts the same language as the following CFG, but without unit productions.

S -> AS | C

A -> aA | bB | C

B -> bB | b

C -> cC | B

S->AS|cC|b|bB

A->aA|bB|b|cC

B->bB|b

C->cC|bB|b

3. Convert the following grammar to Chomsky Normal Form (CNF).

S -> aA | BAa

A -> AA | a

B -> AbB | b

S -> CA | BE

A -> AA | C

B -> FB | b

C->a

D->b

E->AC

F->AD

4. Convert the following grammar to CNF.

S -> XY

X -> aXb | λ

Y -> aY | λ

S -> ED

X -> CB

Y -> AY

A->a

B->b

C->AX

D->AY

E->CB