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Section: 4

Assignment: 1

Course: CSE420

Answer to the Q: N: 1

(a)

S → A a | b
A → A c | S d | ε

After Modification,

S → A a | b
A → A c | A a d | b d | ε

Eliminating left recantion :

S → A a | b
A → b d A' | ε A'
A' → c A' | a d A' | ε

(b)

A → a | B | CBD

B → C | b

C → A | c

D → Ba | d

After modification,

A → a | B | CBD

B → C | b

C → a | B | CBD | c

D → Ba | d

Putting values of B in C,

A → a | B | C B D

B → C | b

C → a | C | b | C B D | c

D → *C a | b a | d

Eliminating left recursion:

A → a | B | C B D

B → C | b

C → a C' | b C' | c C'

C' → B D C' | ∈

D → a C' a | b C' a | c C' a | b a | d

Ans to the Q: N: 2

(a)

$S \rightarrow bSSaaS \mid bSSaSb \mid bSbl \mid a$

Left   factoring:

$S \rightarrow bSS'' \mid a$

$S'' \rightarrow SaaS \mid SaSb \mid b \mid \epsilon$

Left factoring S'':

$S \rightarrow bSS'' \mid a$

$S'' \rightarrow SaS' \mid b \mid \epsilon$

$S' \rightarrow aS \mid Sb \mid \epsilon$

| b)

$S \rightarrow a S S b S \mid a S a S b \mid a b b \mid b$

Left factoring:

$S \rightarrow a S'' \mid b$

$S'' \rightarrow S S b S \mid S a S b \mid b b$

Left factoring $\quad S''$:

$S \rightarrow a S'' \mid b$

$S'' \rightarrow S S' \mid b b$

$S' \rightarrow S b S \mid a S b$