TOA Assignment 2

Q1. A grammar G which is context-free has the productions

S → aAB

A → Bba

B → bB

B → c

Give the derivation and parse tree for the word w=acbabc.

Q2. A CFG given by productions is

S → a

S → aAS

A → bS

Obtain the derivation tree of the word w= abaabaa.

Q3. A CFG given by productions is

S → aSb

S → ab

Obtain the Language generated by L(G).

Q4. A CFG given by productions is

S → aS

S → aA

A → bA

A → b

Obtain the Language generated by L(G).

Q5. A CFG given by productions is

S → aA

S → bS

A → b

Obtain the Language generated by L(G).

Q6. Obtain CFG for the language

a) L(G) = { w | w ϵ {a, b}\*, na (w) = nb (w)}

b) L(G) = { w | w ϵ {a, b}\*, na (w) = 2 nb (w)}

c) L(G) = { w | w ϵ {a, b}\*, na (w) = 3 nb (w)}

d) L(G) = { x | x ϵ {0, 1}\*, x starts and ends with different symbols}

e) L(G) = { x | x ϵ {0, 1}\*,symbol at position i is same as symbol at position i+2 and |x| >= 2}

f) L(G) = {All non palindromes overs {0,1}\*}

g) L(G) = { 0i1j2k | j > i + k }

h) L(G) = { ai bi ci | i >= 1 }

Q7. A CFG given by productions is

S → aB

S → bA

A → aS

A → aAA

A → a

B → bS

B → aBB

B → b

obtain the leftmost derivation and rightmost derivation for the string “aaabbabbba”

Q8. Prove the grammar is ambiguous

S → aB | ab

A → aAB | a

B → ABb | b

Q9. Prove the grammar is ambiguous

S → S|S

S → a

Q0. Prove the grammar is ambiguous

S → a | aAb | abSb

A → aAAb | bS

Q11. Remove useless terminals and productions

S → AB

A → a

B → b

B → C

E → c | λ

Q12. Determine a CFG without λ-production equivalent to the grammar given by

S → ABaC

A → BC

B → b | λ

C → D | λ

D → d

Q13. Obtain a grammar in Chomsky Normal Form (CNF) equivalent to the grammar G with productions P given

S → aAbB

A → aA| a

B → bB | b

Q14. Obtain a grammar in Chomsky Normal Form (CNF) equivalent to the grammar G with productions P given

S → ABa

A → aab

B → AC