AFL ASSIGNMENT - 03
2023

Q1. Consider the following Grammars . Identify the cause of ambiguity & Simplify

Symbol of the

$A.\ P1\ =\ \{S \rightarrow\ ab\ /\ bSa\ /\ aSb/\ A\ /\ SS\}$

$B.\ P2\ =\ \{S\ \rightarrow\ A/\ bb,\ A\ \rightarrow\ B/b,\ B\ \rightarrow\ S/a\}$

$C.\ S \rightarrow Aa,\ S\ \rightarrow\ B,\ B\ \rightarrow A,\ B\ \rightarrow bb,\ A \rightarrow a,\ A\ \rightarrow bC,\ A\ \rightarrow B$

Q2. Show that the following grammar is Ambiguous or not. If ambiguous, identify the cause of ambiguity and simplify it

$S\ \rightarrow AaB/\ aaB;\ A\ \rightarrow\ D;\ B\ \rightarrow\ bbA\ /\ \boldsymbol{\lambda}\ ;\ D\ \rightarrow\ E;\ E\ \rightarrow\ F\ ;\ F\ \rightarrow\ aS$

Q3. Convert the following Grammar to CNF

$E\ \rightarrow\ E\ +\ T\ /\ T\ ;\ T\ \rightarrow\ (E)\ /\ a;$

Q4. Construction of the PDA for the language $L\ =\ \{\ a^n\ b^m c^p/\ ,\ m\ ,\ n,\ p\ >\ 0\}$, subject to the following conditions

I. $n\ =\ m\ +\ p$ II. $m\ =\ n\ +\ p$ III. $p\ =\ n\ +\ m$

Q5. Construct a PDA that accepts: i. Odd Palindrome ii. Even Palindrome

Q6. Convert the following Grammar into Grammar into Greibach Normal Form

I. $S\ \rightarrow\ aAbB;\ A\ \rightarrow\ a;\ B\ \rightarrow\ b$

II. $S\ \rightarrow\ aA;\ A\ \rightarrow B;\ B\ \rightarrow CD/b;\ C\ \rightarrow\ c;\ D\ \rightarrow d$

Q7. Using Pumping Lemma proof that the following language is not Context Free:

a. $L = \{a^n b^n c^n / n > 0\}$

b. $L = \{a^n b^{n+1} c^{n+2} / n > 0\}$

c. $L = \{a^n b^{2n} c^{3n} / n > 0\}$