CS 301: Theory of Automata
Assignment 2
Due: Thursday 31st October, 2019 (In class).

ONLY HANDWRITTEN ASSIGNMENTS WOULD BE ACCEPTED. CHEATING CASES WILL BE ASSIGNED A -10

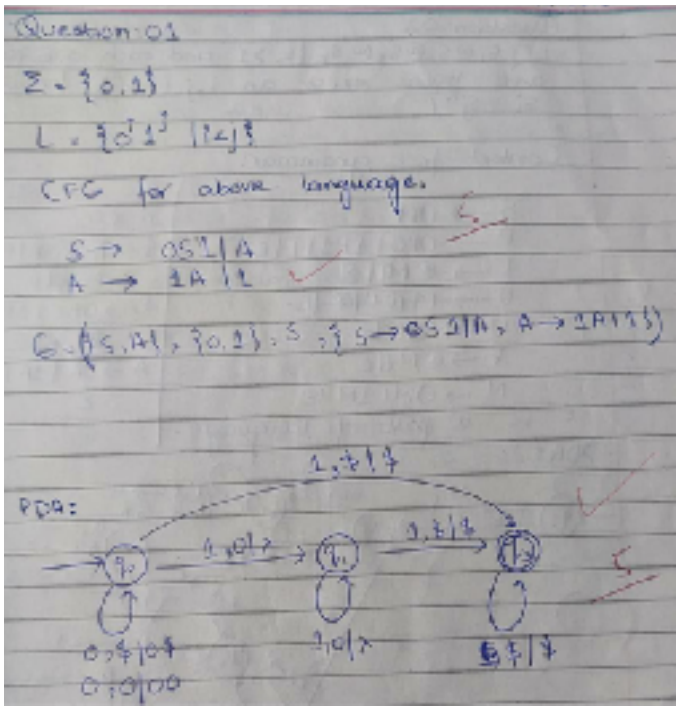
Problem 1

Σ = {0,1}

L = $\{0^i 1^j | \ i<j\}$

a. Write a context free grammar for the above language
b. Make a PDA for the above language

Solution

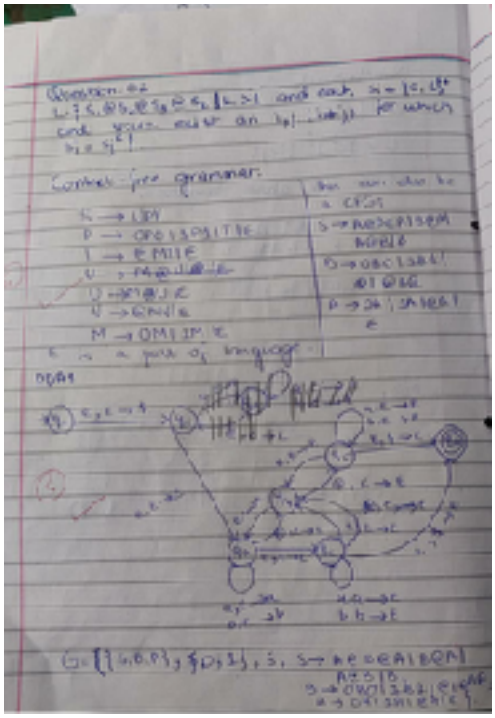


Problem 2

Suppose Σ = {0,1,@}. Consider the language:

L = $\{s_1@s_2@s_3@\ldots@s_k$ | k>1 and each $s_i \in \{0,1\}^*$ and there exist an $i, j \ (i \neq j)$ for which $s_i = s_j^R$ }.
Examples of strings in L are: {01@10, 110@11111@011, …}

a. Write a context free grammar for the above language
b. Make a PDA for the above language



Problem 3

Σ = {0,1,2}

L = {s|s has any number of 1's but the number of zeros are more than the number of twos}
Examples of strings in this language: {0210011, 1200, 000, …}

a. Write a context free grammar for the above language
b. Make a PDA for the above language