



Assignment 4

Deadline 31st May 2021 11:55 pm

Course Code: CS301	Course Name: Theory of Automata
--------------------	---------------------------------

Question 1:

Construct an equivalent P.D.A. from following CFG:

$S \rightarrow aTb \mid b$

$T \rightarrow Ta \mid \epsilon$

Trace the input string "aaab" using stack.

Question 2: P.D.A.

Construct an equivalent P.D.A. by empty stack, from following CFG:

$S \rightarrow 0TT$

$T \rightarrow 0S \mid 1S \mid 0$

Trace the input string belongs to language using stack.

Question 3:

Consider b^* , the start variable is S, and the rules R are the following CFG $G = (V, \Sigma, R, S)$, where $V = \{S, T, X\}$, $\Sigma = \{a, b\}$

$S \rightarrow aT Xb$

$T \rightarrow XT S \mid \epsilon$

$X \rightarrow a \mid b$

Convert G to an equivalent PDA

Question 4:

Define what one might mean by properly nested parenthesis structures involving two kinds of parentheses, say $()$ and $[\]$. Intuitively, properly nested strings in this situation are $([\])$, $([\])[(\])$, but not $([\])$ or $([\])$. Using your definition. Construct the PDA for accepting all properly nested parentheses.

Question 5:

Construct the PDA of the language.

1. $L = \{w \mid w \in 0^n 1^{n+1} \mid n \geq 0\}$
2. $L = \{a^{2n} b^{3n} \mid n \geq 0\}$
3. $L = \{a^4 b^n c^n \mid n > 0\}$
4. $L = \{a^{4n} b^n c^n \mid n > 0\}$
5. $L = \{a^m b^n c^n d^m \mid m, n > 0\}$
6. $L = \{a^n b^n c^m d^m \mid m, n > 0\}$
7. $L_1 = \{a^i b^j \mid 2j \geq i\}$
8. $L_2 = \{a^n b^m c^p \mid n = m + p\}$