

Course- BTech

Course Code- CSET302

Year- Third

Type- Core

Course Name- Automata Theory & Computability

Semester- Odd Batch- BTech 5th Semester

Tutorial-10

Tutorial No.	Name	CO1	CO2	CO3	CO4
10	Pushdown Automaton (PDA)	--	--		--

Objective: Construction of Pushdown Automaton (PDA)

Q1. Construct a PDA that accepts a language $L = \{a^n b^n c^m \mid n, m \geq 1\}$ over $Z = \{b, bd\}$.

Q2. Construct a PDA that accepts a language L over alphabet $Z = \{a, b, c\}$.
 $L = \{a^n b^m c^{n+m} \mid n, m \geq 1\}$

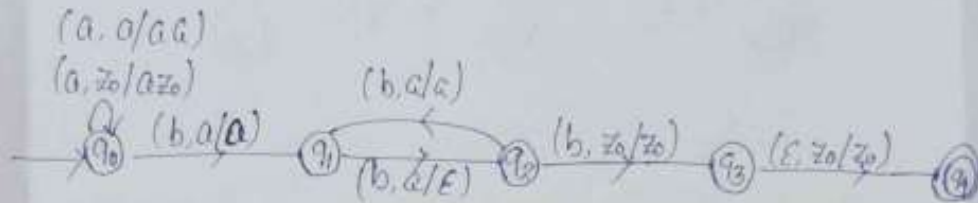
Q3. Construct a PDA that accepts a language L over alphabet $Z = \{a, b\}$.
 $L = \{a^n b^{2n} \mid n \geq 1\}$

This step is to identify the end of all a's in the string.

Q4. Construct a PDA that accepts the language L over alphabet $\Sigma = \{a, b\}$.

$$L = \{a^n b^{2n+1} \mid n \geq 1\}$$

Solⁿ $L = \{a^n b^{2n} b \mid n \geq 1\}$

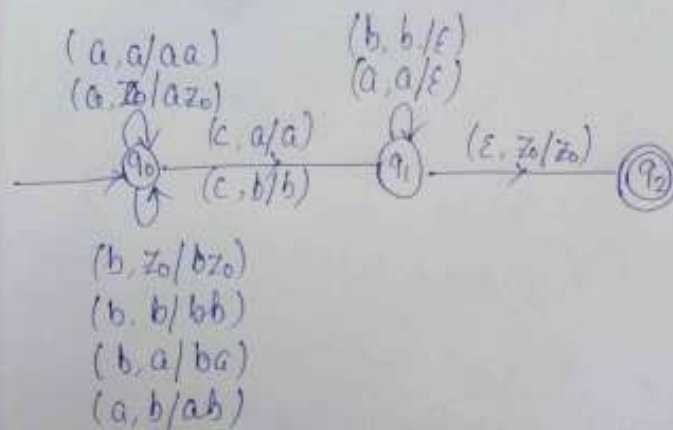


Q5. Construct a PDA for the language over $\Sigma = \{a, b, c\}$.

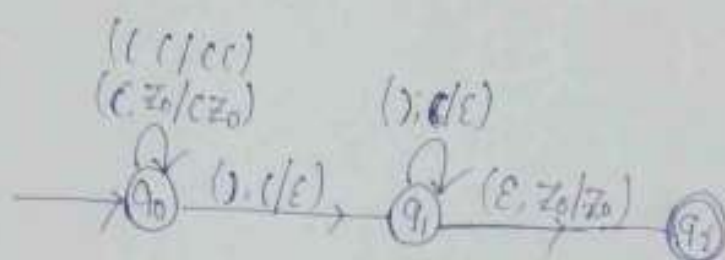
$$L = \{w c w^R \mid w \in (a+b)^+\}$$

Solⁿ

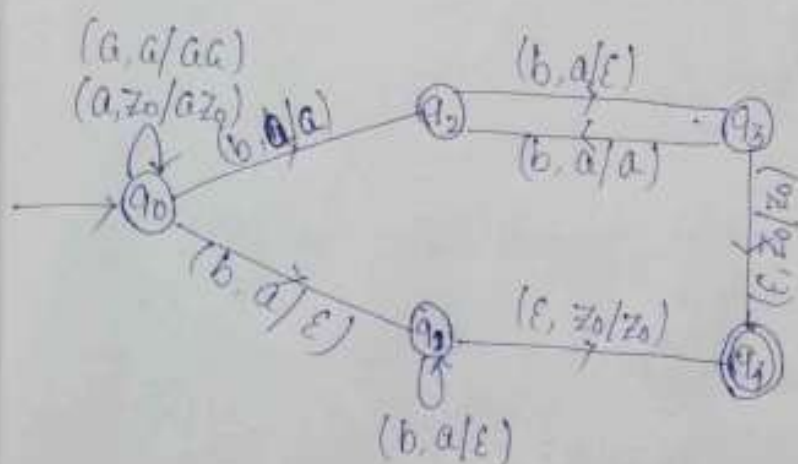
Center is known i.e. c , hence the every string is an odd length palindrome.



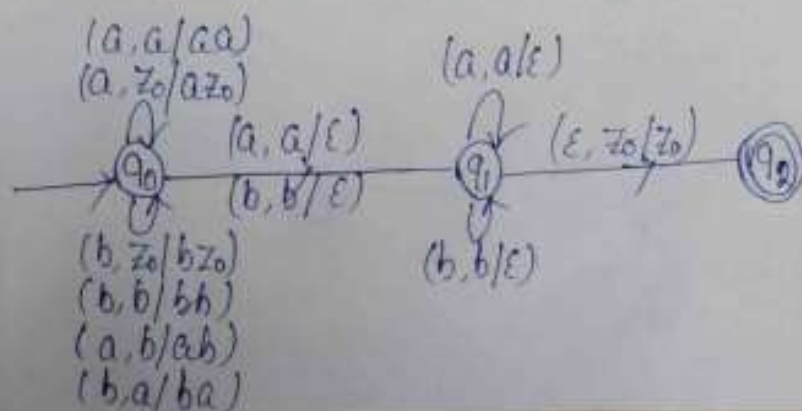
Q6. Construct a PDA for checking balanced parentheses
 $L = \{w \mid w = (u)u\} \text{ over } \Sigma = \{(,)\}$



Q7. Construct a PDA that accepts a language
 $L = \{a^m b^n \mid (m=n) \text{ or } (2m=n), m, n \geq 1\} \text{ over } \Sigma = \{a, b\}$

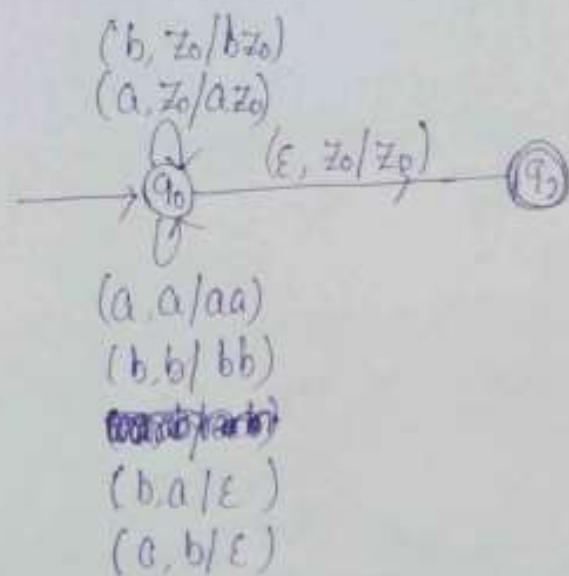


Q8. Construct PDA for language L over $\Sigma = \{a, b\}$.
 $L = \{ww^R \mid w \in (a+b)^+\}$



Q9. Construct a PDA for checking number of a's and b's are equal in a string.

$$L = \{w \mid n_a(w) = n_b(w), n \geq 1\} \text{ over } \Sigma = \{a, b\}$$



Q10. Construct a PDA that accepts the language L over $\Sigma = \{a, b\}$

$$L = \{a^m b^n \mid m < n\}$$

