

Q1	a)	Consider the following PDA: $P = (\{q_0, q_1, q_2, q_3, f\}, \{a, b, c\}, \{Z_0, A, B\}, \delta, q_0, Z_0, \{f\})$ The language $L(P) = \{ \underline{w}cw^R \mid w \in \{a, b\}^+ \}$ Transition functions δ are as follows: 1. $\delta(q_0, a, Z_0) = (q_0, AZ_0)$ 2. $\delta(q_0, b, Z_0) = (q_0, BZ_0)$ 3. $\delta(q_0, a, A) = (q_0, AA)$ 4. $\delta(q_0, b, A) = (q_0, BA)$ 5. $\delta(q_0, a, B) = (q_0, AB)$ 6. $\delta(q_0, b, B) = (q_0, BB)$ 7. $\delta(q_0, c, A) = (q_1, A)$ 8. $\delta(q_0, c, B) = (q_1, B)$ 9. $\delta(q_1, a, A) = (q_1, \epsilon)$ 10. $\delta(q_1, b, B) = (q_1, \epsilon)$ 11. $\delta(q_1, \epsilon, Z_0) = (f, Z_0)$ Analyze the execution of the PDA and provide the sequence of Instantaneous Descriptions (IDs) to demonstrate that the strings: • "aba c aba"
	b)	Using the Pumping Lemma, prove that the language $L = \{ a^n b^n c^n \mid n \geq 1 \}$ is not regular.