Language of PDA:

We define acceptance of language by PDA in terms of.

1) **Acceptance by Final State:**

Let $P = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, F)$ a PDA

the $L(P)$, language acceptance P by Final State as

$$\boxed{\{ w \mid (q_0, w, Z_0) \overset{*}{\underset{P}{\vdash}} (q_f, \wedge, \alpha)}$$

α = Any Stack Symbol

2) **Acceptance by Empty Stack:**

Let $P = (Q, \Sigma, \Gamma, \delta, q_0, Z_0, F)$ be A PDA

$L(P)$, language acceptance by P, by empty stack of

$$\boxed{\{ w \mid (q_0, w, Z_0) \overset{*}{\underset{P}{\vdash}} (q, \wedge, \wedge)}$$

PDA

Ex 1:- Let $L = \{a^n b^n \mid n \geq 1\}$ Construct

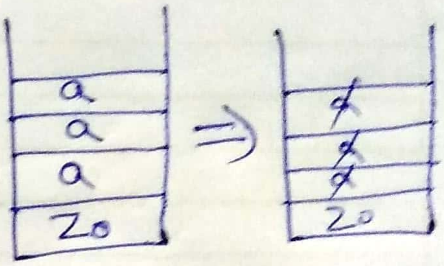
1) PDA Accepting by empty stack. (PDS)

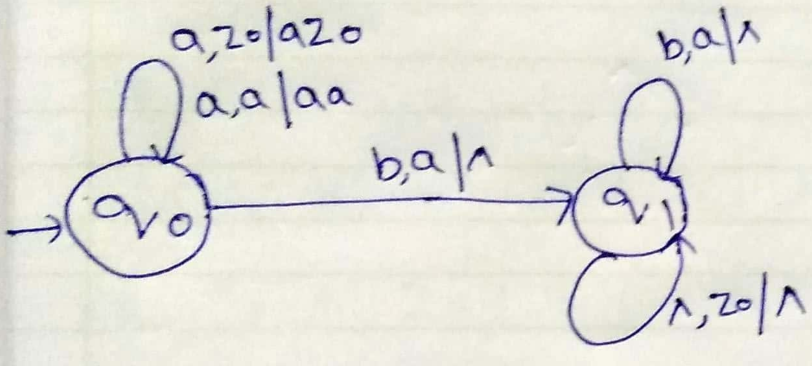
2) ,, ,, ,, final state.

Sol^n :- $L = \{ab, aabb, aaabbb, \ldots\}$

1) Empty stack :.

Take, aaabbb, input string





'OR'

$\delta(q_0, a, Z_0) = (q_0, aZ_0)$

$\delta(q_0, a, a) = (q_0, aa)$

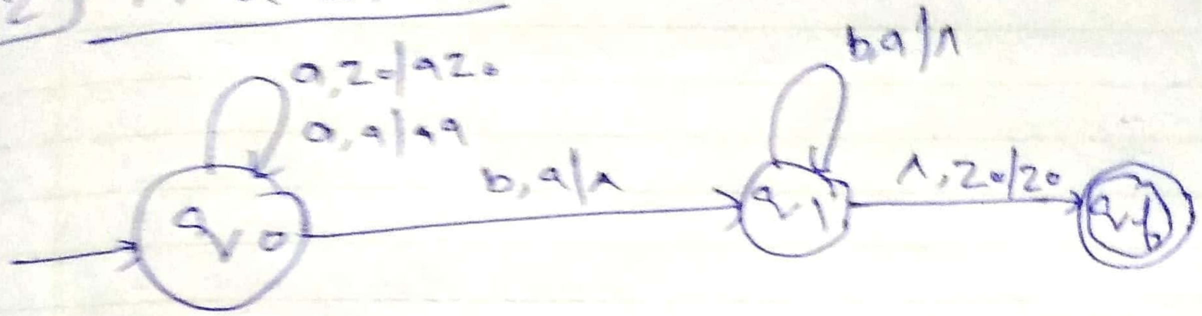
$\delta(q_0, b, a) = (q_1, \Lambda)$

$\delta(q_1, b, a) = (q_1, \Lambda)$

$\delta(q_1, \Lambda, Z_0) = (q_1, \Lambda)$

PDA

2) Final State.



'OR'

$\delta(q_0, a, Z_0) = (q_0, aZ_0)$

$\delta(q_0, a, a) = (q_0, aa)$

$\delta(q_0, b, a) = (q_1, \Lambda)$

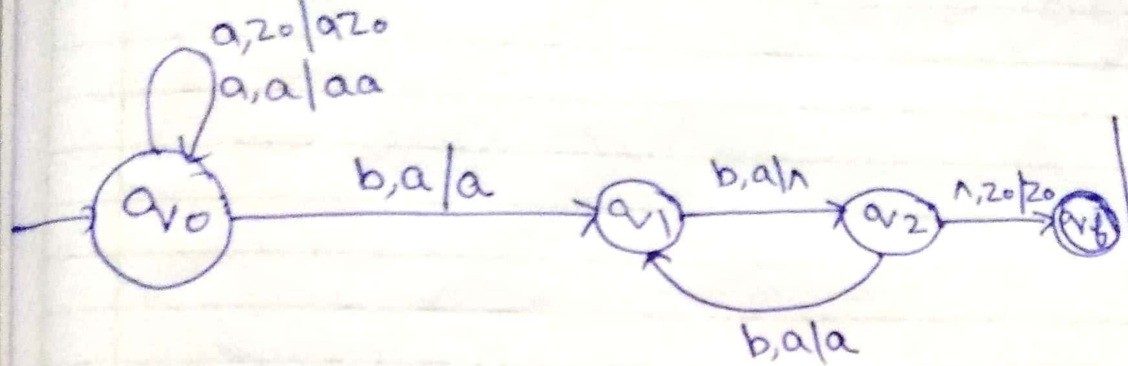
$\delta(q_1, b, a) = (q_1, \Lambda)$

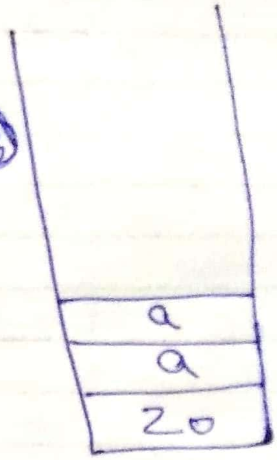
$\delta(q_f, \Lambda, Z_0) = (q_f\ \Lambda, Z_0)$

PDA

Ex 2: Construct a PDA for $L = \{a^n b^{2n} / n \geq 1\}$

Soln: $L = \{abb, aabbbb, aaabbbbbb, \ldots\}$





$\delta(q_0, a, z_0) = (q_0, az_0)$

$\delta(q_0, a, a) = (q_0, aa)$

$\delta(q_0, b, a) = (q_1, a)$

$\delta(q_1, b, a) = (q_2, \wedge)$

$\delta(q_2, b, a) = (q_1, a)$

$\delta(q_2, \wedge, z_0) = (q_f, z_0)$

Acceptance by final state.

Input String
aabbbb

$(q_0, aabbbb, Z_0) \vdash (q_0, abbbb, aZ_0)$

$\vdash (q_0, bbbb, aaZ_0)$

$\vdash (q_1, bbb, aaZ_0)$

$\vdash (q_2, bb, aZ_0)$

$\vdash (q_1, b, aZ_0)$

$\vdash (q_2, \wedge, Z_0)$

$\vdash (q_f, \wedge, Z_0)$

↑

Final State

This string Accepting by PDA

Ans !

PDA