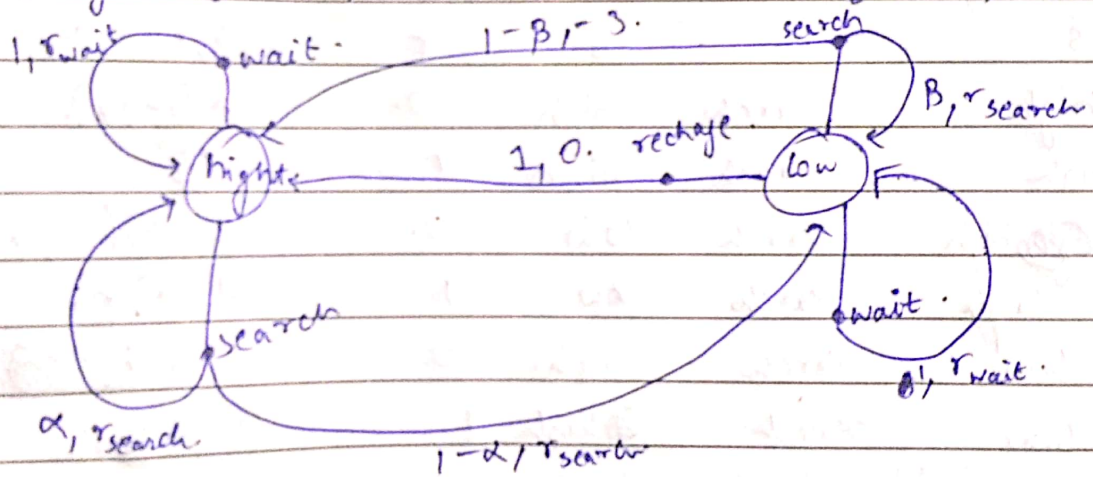


Q1

$S = \{ \text{high}, \text{low} \}$

$A(\text{high}) = \{ \text{search}, \text{wait} \}$

$A(\text{low}) = \{ \text{search}, \text{wait}, \text{recharge} \}$



$r_{\text{search}} \rightarrow$ expected cans collected while searching
 $r_{\text{wait}} \rightarrow$ expected cans collected while waiting.

$$r_{\text{search}} > r_{\text{wait}}$$

~~Q1~~

Let r_{search} be the expectation of following distribution.

$$p(x=1) \rightarrow p. \quad \text{with } p=0.8$$

$$p(x=0) \rightarrow 1-p.$$

$$\textcircled{8} \quad \hookrightarrow p_s(1) + (1-p_s)0.$$

Let r_{wait} be the expectation with $p=0.5$
 $p_w(1) + (1-p_w)0.$

$$\therefore r_{\text{wait}} < r_{\text{search}}$$

s	a	s'	r	$p(s', r s, a)$
high	search	high	0.	$\alpha(1-p_s)$
high	search	high	1	αp_s
high high	search	low	0.	$(1-\alpha)(1-p_s)$
high	search	low	1	$(1-\alpha)p_s$
low	search	high	0	$(1-\beta) \text{ 1-p_s } 1-p_s)$
low	search	low high	1	$(1-\beta) \text{ 1-p_s } p_s$
low	search	low	0	$\beta(1-p_s)$
low	search	low	1	βp_s
high	wait	high	1	p_w
high	wait	high	0	$1-p_w$
low	wait	low	0	$1-p_w$
low	wait	low	1	p_w
low	reshape	high	0	1