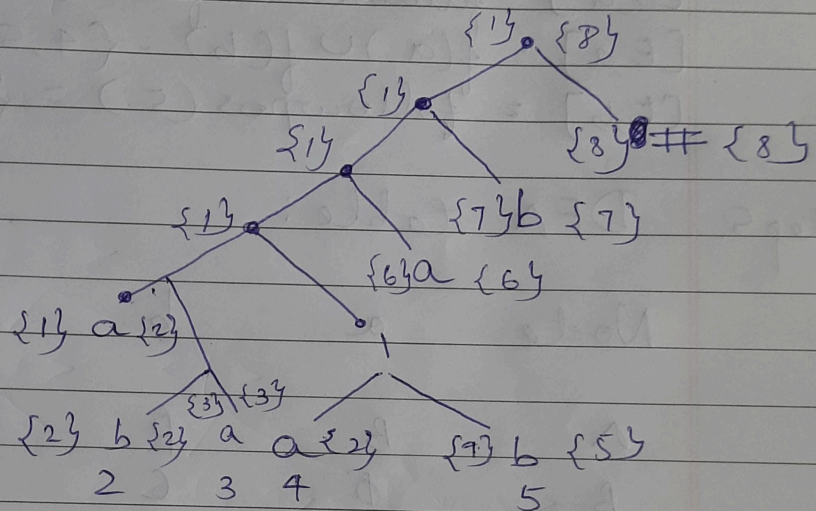## Part-C

1] $a(b|a)(a|b)^* a b$

Step1: Augmented Regular Expression:

$$a(b|a) \cdot (a|b)^* \cdot a \cdot b \cdot \#$$

Step2: Syntax tree:

Step3:

Node	Follow pos
1	{2}
2	{4,5,6}
3	{4,5,6}
4	{4,5,6}
5	{4,5,6}
6	{7}
7	{8}
8	0

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Step 4: Transition States:

$\{1\} \rightarrow A$

$[A, a] = B(r) = \{2\} \rightarrow B$

$[A, b] = \phi$

$[B, a] = \phi$

$[B, b] = followpos(2) = \{4, 5, 6\} \Rightarrow C$

$[C, a] = follow(a) \cup follow(b) = \{4, 5, 6, 7\} \rightarrow D$

$[D, a] = follow(5) \cup follow(4) = \{4, 5, 6, 8\} \rightarrow E$

$[E, a] = f(a) \cup f(b) = \{4, 5, 6, 7\} \rightarrow D$

$[E, b] = followpos(5) = \{4, 5, 6\} \rightarrow C$

Step 5: DFA table:

Node	a	b
A	B	ϕ
B	ϕ	C
C	D	C
D	D	E
E	D	C

Step 6: DFA diagram:-