Exam-3 Zhihao Jin

$\lambda(0) = \{0,1\}$

$TD(\{0,1\}, a) = \lambda(TN(0,a) \cup TN(1,a)) = \lambda(\phi \cup \{1,2\}) = \lambda(2) = \{1,2\}$

$TD(\{0,1\}, b) = \lambda(TN(0,b) \cup TN(1,b)) = \lambda(\{1\} \cup \{1\}) = \lambda(1) = \{1\}$

	TD	a	b
S	$\{0,1\}$	$\{1,2\}$	$\{1\}$
F	$\{1,2\}$	$\{1,2\}$	$\{1\}$
	$\{1\}$	$\{1,2\}$	$\{1\}$

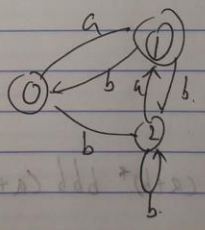
$TD(\{1,2\}, a) = \lambda(TN(1,a) \cup TN(2,a)) = \lambda\{\{2\} \cup \{2\}) = \lambda(2) = \{1,2\}$

$TD(\{1,2\}, b) = \lambda(TN(1,b) \cup TN(2,b)) = \lambda(\{1\} \cup \phi) = \lambda(1) = \{1\}$

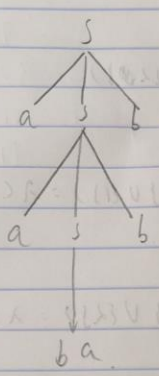
$TD(\{1\}, a) = \lambda(TN(1,a)) = \lambda(2) = \{1,2\}$

$TD(\{1\}, b) = \lambda(TN(1,b)) = \lambda(1) = \{1\}$

	TN	a	b
S	0	1	2
F	1	1	2
	2	1	2



(2) (a)



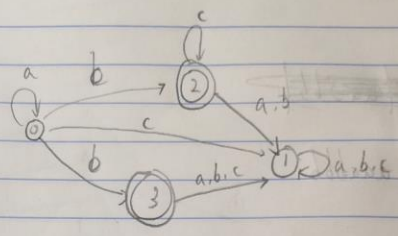
(b) Yes. It's the only parse tree.

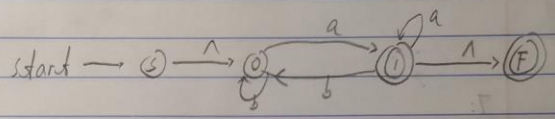
(3): (a)

$(a^* bb c^*)$

(b): $(a+b)^* bbb (a+b)^*$

4:





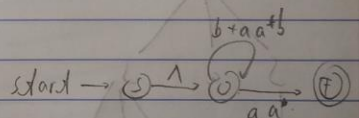
S: Eliminate 1:

$New(0,F) = old(0,F) + old(0,1)\,old(1,1)^*\,old(1,F)$

$= \phi + aa^*\lambda = aa^*$

$New(0,0) = old(0,0) + old(0,1)\,old(1,1)^*\,old(1,0)$

$= b + aa^*b$



$New(S,F) = old(S,F) + old(S,0)\,old(0,0)^*\,old(0,F)$

$= \phi + \lambda(b+aa^*b)^*aa^*$

$= (b+aa^*b)^*aa^*$

6:

(a) S → aSb | aaabbb

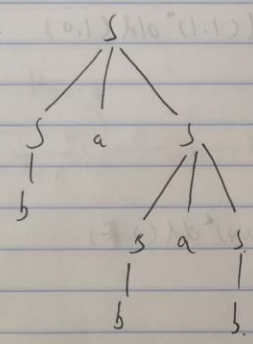
(b) S → ~~ba~~ bbS | ba

7:

S ⇒ SaS ⇒ SaSaS ⇒ babab

S ⇒ SaS ⇒* SaSaS ⇒ baSab

①:



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