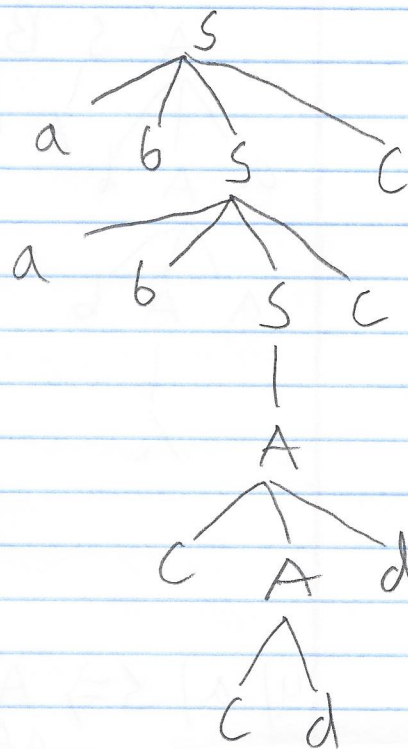


ch:3

1) a) $S \Rightarrow$ abSc
 ababScc
 ababAcc
 ababcAdcc
 ababccddcc

b/

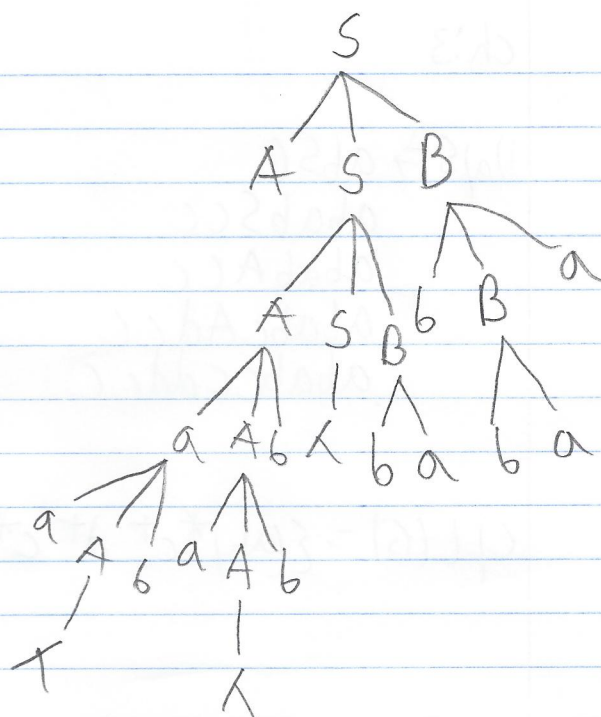
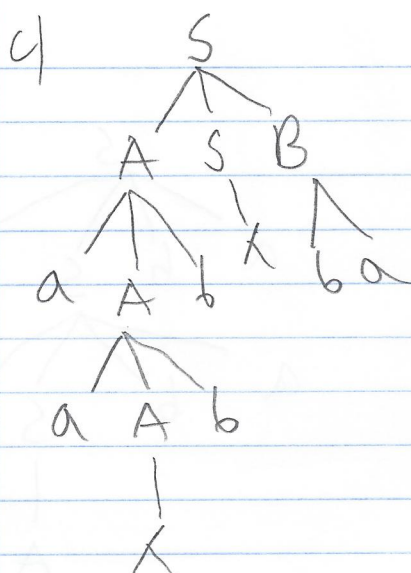


c) $L(G) = \{[ab]^*c^+d^+c^*\}$

2) a) $S \Rightarrow$ ASB
 aASB
 aaAbBSB
 aabBSB
 aabbB
 aabbba

b/ $S \Rightarrow$ ASB
 ASbBa
 ASbbaa
 AASBbbaa
 AASbabbba
 AAAbabbba
 AaAbabbba
 AaaAbabbba
 Aaabbabbba
 aAbaabbabbba
 abaaabbabbba





4) a) $S \Rightarrow AB$
 aAB
 aaB
 $aaAB$
 $aaaB$
 $aaab$

b) $S \Rightarrow AB$
 AAB
 AAb
 Aab
 $aAab$
 $aaab$

12) $S \rightarrow \lambda$
 $S \rightarrow SaSbS \mid SbSaS \mid SS$

15) $S \rightarrow \lambda \mid aA \mid Bb \mid Cc \mid ABC$
 $A \rightarrow aAB \mid aABC \mid \lambda$
 $B \rightarrow bBC \mid \lambda$
 $C \rightarrow cC \mid \lambda$

25) $S \rightarrow aO_1 \mid bE_1 \mid bO_2 \mid aE_2 \mid \lambda$
 $E_1 \rightarrow aO_1 \mid bE_1 \mid \lambda$
 $O_1 \rightarrow aE_1 \mid bO_1$
 $O_2 \rightarrow aO_2 \mid bE_2 \mid \lambda$
 $E_2 \rightarrow aE_2 \mid bO_2$