Voicing assimilation in Dutch (adapted from Kager 1999)

Consider the pattern of voicing assimilation in Dutch (Trommelen and Zonneveld 1979):

a. /d+k/ tk bloedkoraal 'red coral'
b. /k+v/ kf boevorm 'book form'
c. /s+v/ sf bosveen 'tree'
d. /p+z/ fs diepzee 'deep sea'
e. /v+z/ vs drijfzand 'quicksand'
f. /d+v/ tf handvaat 'handle'
g. /t+z/ ts hartzeer 'heartache'
h. /x+t/ xt hoogtij 'heyday'
i. /x+v/ xf hoogvlakte 'plateau'
j. /d+p/ tp huidplooi 'skin crease'
k. /z+p/ sp kaapers 'cheese press'
l. /z+v/ sf kaasvorm 'cheese mold'
m. /s+b/ zb kasboek 'cash book'
n. /b+z/ ps krabzeer 'scratching sore'
o. /x+b/ xb lachbui 'fit of laughter'
p. /f+b/ vb lafbek 'coward'
q. /v+k/ fk lijfknecht 'serf'
r. /d+z/ ts Noordzee 'North Sea'
s. /x+v/ xf pechvogel 'unlucky person'
t. /b+k/ pk slobkous 'gaiter'
u. /f+z/ fs strafzaak 'trial'
v. /p+d/ bd stropdas 'tie'
w. /t+b/ db witboek 'white book'
x. /k+d/ gd zakdoek 'handkerchief'

Two types of voicing assimilation interact in this pattern.

a. State precisely, but informally, the generalizations concerning voicing assimilation in Dutch consonant clusters.

b. The following constraints can be used to account for the assimilation pattern. Show how they must be ranked, and provide pair-wise ranking arguments for each

Faithfulness constraints:

- Ident_{onset}(Stop) ‘An onset stop is featurally identical to its input correspondent’
- Ident_{onset}(Fricative) ‘An onset fricative is featurally identical to its input correspondent’
Markedness constraints:
- Agree ‘the members of a consonant cluster agree in voicing’
- *[+voice, -son] ‘an obstruent is not [+voice]

c. Support your analysis by showing providing full tableaux for the following forms:
   1. voiceless stop + voiced stop: / stropdas /
   2. voiceless fricative + voiced stop: / lafbek /
   3. voiced stop + voiced fricative: / krabzeer /

d. The analysis, as it stands, makes the wrong prediction for the following representative data (transcribed in IPA). First state what the problem is, then propose a constraint (and rank it!) in order to solve the problem:
   a. kaso ‘cash (pl.)’
   b. kazɔ ‘cheese (pl.)’
   c. zɛxo ‘say’
   d. vuru ‘carry’
   e. voxɔl ‘bird’

e. Describe the factorial typology derived from all possible re-rankings (3!) of the two faithfulness constraints with the markedness constraint against voiced-obstruents given in (b). In each case assume that Agree is at the top of the hierarchy.