Some Optional Practice on Allophonic Rules

The following are some optional problems in finding allophonic (phonological) rules. They are intended to help you practice for Assignment 4 (and also eventually Midterm 2).

(1) Oral Stops in Zoque

Consider the following words of Zoque, a Mixe-Zoquean language of Mexico:

[kenba] ‘he sees’    [ndzin] ‘my pine’
[ndʒehtsu] ‘you cut’ [pama] ‘clothing’
[mingeʔtu] ‘he came also’ [mbama] ‘my clothing’
[tʃehtʃaxu] ‘they cut it’ [ŋengeʔtu] ‘I also saw it’
[andʒiʔu] ‘goatee’ [pʌndaʔm] ‘men’
[petpa] ‘he sweeps’ [wixta] ‘he walked’
[mjaŋdamu] ‘you went’ [tʃaŋnaʔʃ] ‘my pine’

a. **Question 1:** Show that [b] and [p] are allophones of the same phoneme.

b. **Question 2:** Show that [t] and [d] are allophones of the same phoneme.

c. **Question 3:** Show that [g] and [k] are allophones of the same phoneme.

*Note:* For this problem, treat [dʒ] and [tʃ] as sequences of phones, rather than as single affricate phones.
(2) **Stops and Affricates in Brazilian Portuguese**

Consider the following words from Brazilian Portuguese (the dialect of Portuguese spoken in Brazil).

[tenu] ‘I have’     [tal] ‘such’     [natu] ‘born’
[kuaṯu] ‘four’     [utaɾ] ‘to annoint’     [tʃivi] ‘I had’
[tʃiu] ‘uncle’     [patʃinaɾ] ‘to skate’     [paɾʃi] ‘party’
[petʃi] ‘comb’     [dadu] ‘given’     [madʒina] ‘godmother’

a. **Question 1:** Show that [t] and [tʃ] are allophones of the same phoneme.

b. **Question 2:** Show that [d] and [dʒ] are allophones of the same phoneme.

*Note:* For this problem, treat [dʒ] and [tʃ] as *single* phones (affricates), rather than as sequences of two phones (as you did for Zoque).
(3) **Answers to ‘Oral Stops in Zoque’**

a. **Question 1:**

*Result of Steps 1 and 2:*

- Phones that precede [b]: [n], [m]  
  All are nasal stops
- Phones that follow [b]: [a]  
  All are [a]
- Phones that precede [p]: #, [t]  
  Nothing in common
- Phones that follow [p]: [e], [a], [ə]  
  All are vowels

*Result of Step 3*

- **Only allophone [b] is preceded by nasal stops**
- Allophone [p] can be followed by [a] too.
- Allophone [b] can be followed by vowels too.

*Result of Step 4*

‘The phoneme /p/ is pronounced as [b] when preceded by a nasal stop.

/p/ \(\rightarrow\) [b] / Nasal-stop ____

b. **Question 2:**

*Result of Steps 1 and 2:*

- Phones that precede [t]: [h], [,ʔ], #, [e], [x]  
  Nothing in common
- Phones that follow [t]: [s], [u], [ʃ], [p], [a]  
  Nothing in common
- Phones that precede [d]: [n], [ŋ]  
  All are nasal stops
- Phones that follow [d]: [ʒ], [a], [z]  
  Nothing in common

*Result of Step 3*

- **Only allophone [d] is preceded by nasal stops**

*Result of Step 4*

‘The phoneme /t/ is pronounced as [d] when preceded by a nasal stop.

/t/ \(\rightarrow\) [d] / Nasal-stop ____

c. **Question 3:**

*Result of Steps 1 and 2:*

- Phones that precede [g]: [n], [ŋ]  
  All are nasal stops
- Phones that follow [g]: [e]  
  All are [e]
- Phones that precede [k]: #, [ə]  
  Nothing in common
- Phones that follow [k]: [e], [n]  
  Nothing in common
Result of Step 3
• Only allophone [g] is preceded by nasal stops
• Allophone [k] can be followed by [e] too.

Result of Step 4
‘The phoneme /k/ is pronounced as [g] when preceded by a nasal stop.
/k/ → [g] / Nasal-stop _____

(4) Answers to ‘Stops and Affricates in Brazilian Portuguese’

a. Question 1:
Result of Steps 1 and 2:
• Phones that precede [t]: #, [a], [u] Nothing in Common
• Phones that follow [t]: [e], [a], [u], [i] Nothing in Common
• Phones that precede [tʃ]: #, [a], [i], [e], Nothing in common
• Phones that follow [tʃ]: [i] All are [i]

Result of Step 3
• Only allophone [tʃ] is followed by [i]

Result of Step 4
‘The phoneme /t/ is pronounced as [tʃ] when followed by [i].
/t/ → [tʃ] / _____ [i]

b. Question 2:
Result of Steps 1 and 2:
• Phones that precede [d]: #, [a], [o], [i], [ɐ] Nothing in Common
• Phones that follow [d]: [a], [i], [e], [u] Nothing in Common
• Phones that precede [dʒ]: #, [o], [i], [a], Nothing in common
• Phones that follow [dʒ]: [i] All are [i]

Result of Step 3
• Only allophone [dʒ] is followed by [i]

Result of Step 4
‘The phoneme /d/ is pronounced as [dʒ] when followed by [i].
/d/ → [dʒ] / _____ [i]