Examination 1

Write succinct answers to the following questions (the length of the question hints at how long the answer needs to be). Avoid the shotgun approach, where you tell us everything you think is relevant in the hope that some bit of it will be what we are looking for.

1. Although many languages have long as well as short voiceless stops, relatively few have long as well as short voiced stops. Why should this be so? Hint: What difficulty is compounded by making a voiced stop long? In Sindhi, what were long voiced stops in Common Indic (the ancestor of Sindhi and many other languages now spoken in northern India) have become implosives. How does implosion solve the problem presented by a long voiced stop?

2. Ladefoged & Maddieson (1996) describe a “linguo-labial” place of articulation for stops (pp. 18-19) and fricatives (p. 143). What is the active articulator in these sounds? Explain your answer.

3. Figure 3.11 (p. 71) shows the amount of air flowing out of the mouth (oral air flow), the size of the glottal opening (glottal width), and the waveforms for three kinds of stops in Icelandic, pre-aspirated, post-aspirated, and unaspirated. Figure 3.5 (p. 59) shows the size of the glottal opening in Hindi voiceless post-aspirated, voiceless unaspirated stops and breathy voiced stops. The data displayed in these figures for the two kinds of stops that occur in both languages, voiceless aspirated and unaspirated, clearly disagree. How? The pre-aspirated and breathy voiced stops in these languages are similar to one another in one way, but very different in another. What is the similarity and what is the difference?

4. Languages are far more likely to have voiceless than voiced fricatives; indeed many languages have no voiced fricatives at all. Why should this be so? Hint: How does the average size of the glottal opening differ during a voiced compared to a voiceless sound, and what effect would that have on how much air flows up through the glottis during the sound?

5. Table 5.7 (p. 164) shows that alveolar, post-alveolar, and domed post-alveolar sibilants can contrast in whether their articulations are apical (Rows 2, 5, and 6) or laminal (Rows 3, 4, or 7). The contrast between the sub-apical palatal in Row 10 and the palatalized post-alveolar in Row 8 can also be described as in part apical versus laminal. There are two entries in this table, however, where the sound either must be apical (Row 1) or it must be laminal (Row 9). For each case, explain why the other articulation is impossible. Hint: Different explanations are needed for each case.

6. The zip file includes three examples of the words *repel, rebel*, *metallic*, *medallion*, *record*, and *regard*. In the table below, list the durations of the stop closure and the voice onset times for each example.

word	closure duration	voice onset time
repel2		
repel3		
repel5		
rebel1		
rebel3		
rebel5		
metallic1		
metallic2		
metallic4		
medallion1		
medallion2		
medallion5		
record3		
record4		
record5		
regard1		
regard4		
regard5		

Do the values for closure duration or voice onset time differ systematically between [p, t, k] versus [b, d, g]? If so, how? Do these values differ systematically between the three places of articulation: [p] versus [t] versus [k] or [b] versus [d] versus [g]?

7. Other sound files include three tokens each of the words *huge*, *hooch*, and *hatch*. Select an interval 40 ms long in the middle of the initial [h] in each word

and view a spectral slice of that interval. Measure the frequencies of up to the highest three peaks you see in the range between 1000-4000 Hz and list their values in the table below. You may not see as many as three peaks in some tokens. As indicated by the column heads in the table, list the peaks in order of intensity, not order of frequency.

Words	Most intense peak frequency	Next most intense peak frequency	Least intense peak frequency
huge3			
huge4			
huge5			
hooch3			
hooch4			
hooch5			
hatch2			
hatch3			
hatch5			

How do the peaks' frequencies differ between [h]s in these three contexts?

8. Now compare the final consonants in the tokens of *huge* and *hooch* with those in the tokens of *rouge* and *louche*. What is the manner of articulation of the final consonants in *huge* and *hooch*? What is the manner of articulation of those in *rouge* and *louche*? How are those differences in manner of articulation displayed in the waveforms and spectrograms of these words? Finally compare the initial consonants in the three tokens of *chill* and *shill* and the three tokens of *John* and *genre*. How do they differ from one another and how do those differences correspond to the difference in manner of articulation these two pairs of sounds? Once again, describe how the waveforms and spectrograms of the two pairs of words differ from one another. You may also wish to measure the durations of certain intervals in making these comparisons.