Exam 2 Practice Questions

Jackson Petty

Club marks (♣) denote increased levels of difficulty. Any questions marked with a single club (♣) involve a synthesis of multiple distinct concepts, but are fair-game for the exam; questions involving more than one (♣♣ or ♣♣♣) are harder than anything which will appear on the exam, but may be useful for developing a deeper intuition about the material. Note that Exam 2 will not include any of the material covered by my lecture on LLMs.

To check your answers or work through the problems together, come to my **office hours (2–4PM on Friday, 7 November 2025)** or to the **study session (4:45–7PM on Monday, 10 November 2025)**, both on the 5th floor of 10 Washington Pl.

1 The Mind and the Brain

Problem 1. Definitions.

(a) What is meant by the terms *hemisphere*, *corpus callosum*, *Wernicke's area*, and *Broca's area*, in the context of the brain?

(b) Define *aphasia*, *Wernicke's aphasia*, and *Broca's aphasia*.

(c) Define *hemodynamic imaging* and *electrophysiological imaging*.

(d) Define *fMRI*, *EEG*, *PET*, and *MEG*.

(e) Define *localization*, *lateralization*, and *contralaterlization*.

(f) Define *dichotic listening*.

(g) Define *split-brain stimulation*.

Problem 2. Conceptual questions.

(a) What are the scanners/imaging methods used in hemodynamic imaging?

(b) What are the scanners/imaging methods used in electrophysiological imaging?

(c) What are the spatial and temporal resolutions of the various scanners/imaging methods discussed in this course. Form a generalization about the relative merits of hemodynamic and electrophysiological imaging.

(d) What are some aspects of the language faculty implicated in Wernicke's aphasia? In Broca's?

(e) Explain the connection between Wernicke's area and Wernicke's aphasia. Do the same for Broca's.

(f) What kinds of cognition occur in the left hemisphere of the brain? In the right?

(g) [♣] What is some evidence we have for localization of the language faculty in the brain?

(h) [♣] What are some similarities between animal communication and human language? What are some differences between them?

(i) What is some evidence we have that babies exhibit some understanding of language before they can produce it?

(j) [♣♣♣] You are a researcher whose job is to determine if an unknown participant possesses language faculty. You cannot see the participant, and so you must form your judgment based solely on the participant's ability to respond to stimuli you present them. Because the participant is hidden from you, you do now know ahead of time whether the participant is an adult human who speaks your language, and adult human who speaks a different language, an adult human who is deaf but proficient in a signed language, a human baby, a chimpanzee, a dolphin, or a multimodal language model. You may elicit any productions you wish, so long as they do not reveal the identity of the participant. *What stimuli can you give to answer the question of language faculty possession? How confident can you be in your determination?*

2 Articulatory Phonetics

Problem 1. Definitions.

(a) What is meant by *phonetics*?

(b) Define *consonant*, *vowel*, and *diphthong*.

(c) Define *voicing*, *rounding*, *place of articulation*, *backness*, *manner of articulation*, *height*, and *tenseness*.

(d) Give descriptions for the various places of articulation: *bilabial*, *labiodental*, *interdental*, *alveolar*, *palatal*, *velar*, and *glottal*.

(e) Give descriptions for the various manners of articulation: *(oral) stop*, *nasal (stop)*, *fricative*, *affricate*, *glide*, and *lateral*.

(f) Define *continuant* and *non-continuant*.

(g) Define *obstruent* and *sonorant*.

(h) Define *labial* and *coronal*.

(i) Define *sibilant*.

(j) Define *anterior*.

(k) Define *diphthong*.

(l) Define *flap* and *aspiration*.

(m) What is meant by a sound's *articulatory description*?

(n) Define *oral cavity*, *nasal cavity*, *glottis*, *larynx*, *vocal cords*, *uvula*.

Problem 2. Conceptual Questions.

(a) In the provided IPA consonant chart (table 1), identify the categories of continuant, non-continuant, obstruent, sonorant, labial, coronal, sibilant, and anterior.

(b) In the provided IPA vowel chart (fig. 1), identify which vowels are tense, lax, rounded, and unrounded.

(c) Provide the articulatory description for the following consonants: [m], [t], [ŋ], [j], [t͡ʃ], [w].

(d) Provide the articulatory description for the following vowels: [æ], [i], [ʊ], [ə].

(e) [♣] What is special about schwa [ə]?

(f) [♣♣] Cover up the places/manners of articulation on the consonant chart and fill in the values from memory. Do the similar thing for the vowel chart.

(g) [♣♣] Cover up the IPA symbols in the consonant and vowel charts, and fill in the tables from memory.

(h) [♣♣] Recreate the IPA consonant and vowel charts entirely from memory.

Problem 3. Provide phonetic transcriptions (in IPA) for the following words written in English orthography.

(a) ⟨recuse⟩

(b) ⟨high⟩

(c) ⟨young⟩

(d) ⟨vision⟩

(e) ⟨knave⟩

(f) ⟨lease⟩

(g) ⟨tease⟩

(h) ⟨joke⟩

(i) ⟨wreath⟩

Problem 4. Identify the English word represented by the following phonetic transcriptions.

(a) [baʊ]
(b) [hoʊ]
(c) [jɛɪ]
(d) [ðaɪ]
(e) [θaɪ]

3 Phonology

Problem 1. Definitions.

(a) Define *phonology*.
(b) Define *phonotactics*.
(c) Define *allophone* and *phoneme*, *complementary distribution*, and *conditioning environment*.
(d) Define *coarticulation*, *assimilation*, and *dissimilation*.
(e) Define *sonority*.
(f) Define *syllable*, *onset*, *rime*, *nucleus*, *coda*.
(g) What does it mean for a sound to be *syllabic*?
(h) Define a *minimal pair*.
(i) Define *natural class*.
(j) What is meant by *categorical perception*?
(k) What are the *McGurk effect* and the *phonemic restoration effect*?

Problem 2. Conceptual questions.

(a) Both phonetics and phonology study the sounds of a language. Explain how they differ.
(b) What does it mean to say that two sounds contrast phonemically in a language?
(c) What does it mean to say that two sounds are in allophonic variation with one another in a language?
(d) Place the following sound categories in order of their sonority: *glide*, *stop*, *vowel*, *liquid*, *nasal*, *fricative*.
(e) [♣] How can you determine whether two sounds are phonemes in a language? Whether they are allophones of one another?

(f) [♣♣♣] In lecture, we stated that there are some similarities between the structure of syllables and that of words or sentences; for instance, it seems that both are well-modeled by trees. In what ways is this "structure of phonology" different from that of morphology or syntax?

Problem 3. Identify minimal pairs in English which distinguish the following sounds, or state that it cannot be done.

(a) p~b

(b) r~l

(c) [♣] n~ŋ

(d) æ~a

(e) [♣] ə~ʌ

Problem 4. English possesses a regular plural morpheme ⟨-s⟩, as in the word ⟨dogs⟩.

(a) Identify all allomorphs of the regular plural marker in English, giving examples of each.

(b) [♣] Identify the conditioning environments for each allomorph.

(c) [♣♣] What is the phonemic representation of the regular plural morpheme? What rules derive the observed allomorphs?

Problem 5. Identify the features each set of sounds shares.

(a) [i ɪ æ]

(b) [ɪ ə ɔ]

(c) [p m v]

(d) [b m v]

(e) [b a z]

Problem 6. Consider the distribution of [r] and [l] in Korean in the following words. (Some simplifying changes have been made in these transcriptions, which have no bearing on the problem.)

rubi	"ruby"	mul	"water"
kir-i	"road (NOM.)"	pal	"arm"
saram	"person"	səul	"Seoul"
irum-i	"name (NOM.)"	ilgop	"seven"
ratio	"radio"	ibalsa	"barber"

(a) Are [r] and [l] allophones of one or two phonemes?

(b) Do they occur in any minimal pairs?

(c) Are they in complementary distribution?

(d) In what environments does each occur?

Problem 7. Here is some additional data from Korean:

son	"hand"	ʃihap	"game"
som	"cotton"	ʃilsu	"mistake"
sosəl	"novel"	ʃipsam	"thirteen"
sek	"color"	ʃinho	"signal"
isa	"moving"	maʃita	"is delicious"
sal	"flesh"	oʃip	"fifty"
kasu	"singer"	miʃin	"superstition"
miso	"grin"	kaʃi	"thorn"

(a) Are [s] and [ʃ] allophones of the same phoneme, or is each an allophone of a separate phoneme? Give your reasons.

(b) If you conclude that they are allophones of one phoneme, state the rule that can derive the phonetic allophones.

Problem 8. In Southern Kongo, a Bantu language spoken in Angola, the nonpalatal segments [t], [s], and [z] are in complementary distribution with their palatal counterparts [t͡ʃ], [ʃ], and [ʒ], as shown in the following words:

tobola	"to bore a hole"	t͡ʃina	"to cut"
tanu	"five"	tjiba	"banana"
kesoka	"to be cut"	ɲkoʃi	"lion"
kasu	"emaciation"	nsele	"termite"
kunezulu	"heaven"	aʒimola	"alms"
nzwetu	"our"	lolonʒi	"to wash house"
zevo	"then"	zenga	"to cut"
ʒima	"to stretch"	tenisu	"tennis"

(a) State the distribution of each pair of segments.

(b) Using considerations of simplicity, which phone should be used as the underlying phoneme for each pair of nonpalatal and palatal segments in Southern Kongo?

(c) State in your own words the one phonological rule that will derive all the phonetic segments from the phonemes. Do not state a separate rule for each phoneme; a

general rule can be stated that will apply to all three phonemes you listed in (b). Try to give a formal statement of your rule.

(d) Which of the following are possible words in Southern Kongo, and which are not?
i. tenesi ii. lotʃunuta iii. zevoʒzi iv. ʃʃi v. ŋkasa vi. iʒiloʒa

	Bilabial	Labiodental	Interdental	Alveolar	Palatal	Velar	Glottal
Stop (oral)							
voiceless	p			t		k	ʔ
voiced	b			d		g	
Nasal (voiced)	m			n		ŋ	
Fricative							
voiceless		f	θ	s	ʃ		h
voiced		v	ð	z	ʒ		
Affricate							
voiceless					t͡ʃ		
voiced					d͡ʒ		
Glide							
voiceless	ʍ				j	ʍ	
voiced	w					w	
Liquid (voiced)							
(central)				r			
(lateral)				l			

Table 1: IPA Consonant Chart for English

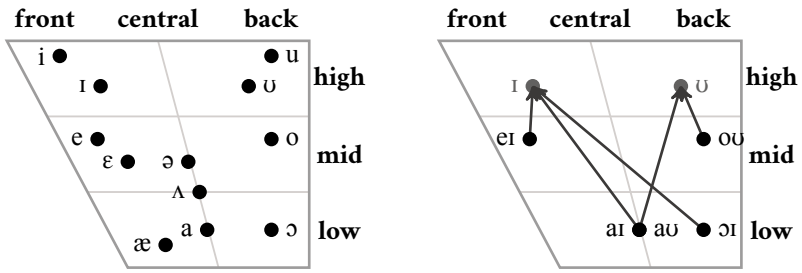

Figure 1: IPA Vowel (**left**) and Diphthong (**right**) Chart for English