ENG507

Final-Term (Solved)

ABSTRACT

This comprehensive collection of notes is accurately crafted to empower students to excel academically, ensuring they achieve a minimum of 80% marks in their examinations. The content is organized with clarity and precision, focusing on key concepts, critical analyses, and practical applications tailored to the syllabus. These notes serve as a reliable resource for both thorough preparation and last-minute revision. Designed to inspire confidence and mastery, this guide is an essential tool for students striving for academic excellence.

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Phonetics and Phonology

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(02 Marks Questions)

Q. spectrogram help to know about bilabial sound.....2 [The most favourite of VU; V.V.IMP for 2 marks questions. They are asking about stops or bilabial or approximants.]

- **Voiced** - vertical striations corresponding to the vibrations of the vocal folds
- **Bilabial** - locus of both second and third formants comparatively low
- **Alveolar** - locus of second formant about 1700–1800 Hz.
- **Velar** - usually high locus of the second formant
- **Retroflex** - general lowering of the third and fourth formants
- **Stop** - gap in pattern (with burst for voiceless and sharp formant beginning for voiced stops)
- **Fricative** - random noise pattern in higher frequency regions
- **Nasal** - formant structure similar to that of vowels (with formants at 250, 2500, and 3250)
- **Lateral** - formant structure similar to that of vowels (with formants at 250, 1200, and 2400)
- **Approximant** - formant structure similar to that in vowels, usually changing

Q. Memory for Speech [Another favourite of VU; V.V.IMP for 2 marks questions. They ask it for speaking style, sound change or any one of them.]

The role of the memory for speech under the exemplar theory suggests that many instances of each word are stored in memory and their phonetic variability is memorized rather than computed. The main postulates of the concepts are given here:

- **Language universal features**: Broad phonetic classes (e.g., aspirated vs. unaspirated) derive from physiological constraints on speaking or hearing, but their detailed phonetic definitions are arbitrary—a matter of community norms.
- **Speaking styles**: No one style is basic (from which others are derived), because all are stored in memory. Bilingual speakers store two systems.
- **Generalization and productivity**: Exemplar theory says that generalization is also possible within productivity. Interestingly, productivity—the hallmark of linguistic knowledge in the phonetic implementation approach—is the least developed aspect of the exemplar theory.
- **Sound change**: Sound change is phonetically gradual and operates across the whole lexicon. It is a gradual shift as new instances keep on adding.

Q. Primary set of Cardinal Vowels

The primary set includes eight vowels in total (from 1 to 8); the front unrounded vowels [i, e, ɛ, a], the back unrounded vowel [ɑ] and the rounded back vowels [ɔ, o, u].Symbol was given and we had to write the lip jaw and tongue position.

Q. What specific terms are used for the consonants cluster Cc and ccc in syllable? (2)

Consonant sequences are called clusters (e.g., CC – two consonants or CCC – three consonants). Most of the phonotactic analyses are based on the syllable structures and syllabic templates.

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Q. How many syllables in word minimization, separate with hyphens. 2

/mɪ. nɪ. maɪ. zeɪ. ʃ(ə)n/ CV.CV.CV.CV.CVC It has 5 syllables

Q. Define syllable.

A unit of pronunciation having one vowel sound, with or without surrounding consonants, forming the whole or a part of a word; e.g., there are two syllables in water and three in inferno.

Q. In what way Voice Onset time is related to the aspirated sounds? 2

In order to understand VOT, the three types of plosive sounds are to be explained – voiced, voiceless and a voiceless aspirated sound. Most aspirated (largest positive VOT) at the top to most voiced (largest negative VOT) at the bottom. The Navajo aspirated stops have a very large VOT value that is quite exceptional (150 MS).

Q. How pitch is calculated by looking at the waveform

Zoom into a small piece of the waveform in the middle of the vowel and measure the period by highlighting one complete cycle and noting the time associated with it (in the panel above the waveform).

Q. How to boundary removes in Praat software.

To remove a boundary that you have made - Highlight the boundary - Go to Boundary > Remove OR click Alt+backspace.

Q. Two main categories of language

Languages of the world are; divided into two broad categories: stress timed language and syllable timed languages.

Q. What are three formants help in distinguishing vowel from each other?

The lowest three formants distinguish vowels from each other

Q. How could I get findings while doing research on Pakistan regional language? (2)

Pakistani regional languages are the part of the rich linguistic regions. (Himalaya Hindu Kush (HKH) region, one of the richest regions in the world linguistically and culturally) may be very potential area for research in the fields of areal and typological linguistics (description of linguistic features cross linguistically). While working on Pakistani regional languages, one may apply for funding from international organizations (e.g., organization for endangered languages and UNISCO).

Q. Which phonetic branch is dependent on the use of instruments? 2

The latest trends under experimental phonetics include brain functions in speech production and processing (by using the latest equipment – many special instruments such as x-ray techniques)

Q. What is acoustic correlate of vowel height? (2)

Acoustically, vowels are mainly distinguished by the first two formant frequencies F1 and F2; F1 is inversely related to the vowel height (which means that smaller F1 amplitude = higher vowels), and F2 is related to the front or back of the vowels (smaller F2 amplitude = more back vowels).

Q. How a spectrogram image tell you about a velar sound

Velar is usually high locus of the second formant

Q. What spectrographic hints will tell you about plosives (stop)?

Gap in pattern (with burst for voiceless and sharp formant beginning for voiced stops)

Q. In spectrograms, what area indicates the intensity of components? 2

In spectrograms, time runs from left to right, the frequency of the components is shown on the vertical scale, and the intensity of each component is shown by the degree of darkness. It is thus a display that shows, roughly speaking, dark bands for concentrations of energy at particular frequencies—showing the source and filter characteristics of speech.

Q. Which varieties of English are called rhotic? 2

Varieties having this feature are rhotic (in which /r/ is found in all phonological contexts)

Q. How tone (high vs low)change the meaning of the word [ma] in Mandarin? 2

For example, in Mandarin Chinese, [má] said with a high pitch means 'mother' while [mà] said on a low rising tone means 'hemp'. In other (non-tonal) languages, tone forms the central part of intonation, and the difference between, for example, a rising and a falling tone on a particular word may cause a different interpretation of the sentence in which it occurs. In the case of tone languages, it is usual to identify tones as being a property of individual syllables, whereas an intonational tone may be spread over many syllables.

Q. Types of tone. (2)

1. fall,
2. rise,
3. 3. fall–rise and
4. rise–fall

(03 Marks Questions)

Q. Source Filter Theory of Speech Production

Source-filter theory is an important concept in acoustic phonetics. It is a model of speech (e.g., vowel) production. According to this theory, source refers to the waveform of the vibrating larynx. Its spectrum is rich in harmonics, which gradually decrease in amplitude as their frequency increases. The various resonance chambers of the vocal tract, especially the movements of the tongue and lips, act on the laryngeal source in the manner of a filter, reinforcing certain harmonics

relative to others. Thus the combination of these two elements (larynx as source and cavity as filter) is known as the source-filter model of speech (e.g., vowel) production.

Q. Overtone in source filter theory

When discussing differences in quality, we noted that the quality of a vowel depends on its overtone structure (i.e., formants). Now putting this idea another way, we can say that a sound (e.g., vowel) contains a number of different pitches simultaneously. There is the pitch at which it is actually spoken, and there are the various overtone pitches that give it its distinctive quality. We distinguish one vowel from another by the differences in these overtones. The overtones are called formants, and the lowest three formants distinguish vowels from each other.

Q. Overtones on vocal track

All voiced sounds are distinguishable from one another by their formant structure (frequencies). This idea could be understood by considering the vocal tract as a tube and thus the concept is when the vocal fold pulses have been produced at a steady rate, the "utterance" is on a monotone. In other words, what you hear as the changes in pitch are actually the changes in the overtones of this monotone "voice." These overtone pitch variations convey a great deal of the quality of the voiced sounds. The rhythm of the sentence is apparent because the overtone pitches occur only when the vocal folds would have been vibrating.

Q. Tone and Tonal language

Tone (in phonetics and phonology) as a suprasegmental feature refers to an identifiable movement (variation) or level of pitch that is used in a linguistically contrastive way. In tone (tonal) languages, the linguistic function of tone is to change the meaning of a word. For example, in Mandarin Chinese, [ma] said with a high pitch means 'mother' while [ma] said on a low rising tone means 'hemp'. In other (non-tonal) languages, tone forms the central part of intonation, and the difference between, for example, a rising and a falling tone on a particular word may cause a different interpretation of the sentence in which it occurs. In the case of tone languages, it is usual to identify tones as being a property of individual syllables, whereas an intonational tone may be spread over many syllables. In the analysis of English intonation, tone refers to one of the pitch possibilities for the tonic (or nuclear) syllable.

Q. Tube model

The formants that characterize different vowels are the result of the different shapes of the vocal tract. The air in the vocal tract is set in vibration by the action of the vocal folds (in larynx). Every time the vocal folds open and close, there is a pulse of acoustic energy (activation). Irrespective of the rate of vibration at source (of the vocal folds), the air in the vocal tract will resonate at these frequencies as long as the position of the vocal organs remains the same. Because of the complex shape of the filter (tract), the air will vibrate in more than one way at once. So, the relationship between resonant frequencies and vocal tract shape is actually much more complicated than the air in the back part of the vocal tract vibrating in one way and the air in other parts vibrating in

another. The vocal folds may vibrate faster or slower, giving the sound a higher or lower pitch, but the formants will be the same as long as the position of the tube (vocal tract) is the same.

Q. Describe the cardinal vowels according to lips, tongue and jaw position. Æ and œ (3 marks)

Firstly, the shape of the lips (lip-rounding), rounded (for sounds like /u:/ vowel), neutral (as for ə - schwa sound) or spread (as in /i:/ sound in word like sea or – when photographers traditionally ask you to say "cheese" /tʃi:z/ in order to make you look smiling. Secondly, part of the tongue - the front, the middle or the back of the tongue may be raised, giving different vowel qualities: compare /æ/ vowel (as in word 'cat') as a front vowel, with the /ɑ:/ vowel (as in 'cart') which is a back vowel. Thirdly, the tongue (and the lower jaw) may be raised 'close' to the roof of the mouth (for close vowels. e.g. /i:/ or /u:/), or the tongue may be left 'low' in the mouth with the jaw comparatively 'open' (as for open vowels e.g., /a:/ and /æ/.

Q. Cardinal vowels

The English phonetician Daniel Jones introduced a system in early 20th century and worked out on a set of vowels called the "cardinal vowels" comprising of eight vowels to be used as reference points (so that other vowels could be related to them like the corners and sides of a map). His idea of cardinal vowels became a success and it is still used by experts and students for vowel description. Cardinal vowel system is a chart or four-sided figure (the exact shape of which has been changed from time to time). It is a diagram to be used both for rounded and unrounded vowels, and Jones proposed that there should be a primary and a secondary set of cardinal vowels.

Q. Secondary cardinal vowels/ cardinal vowels were given, and their articulation with respect to lips, jaws and tongue was asked

They are easy to understand in connection with the primary cardinal vowel system. Following r the secondary cardinal vowels (their numerical codes and features) as pointed out Danial Jones:

- Close (high) front rounded vowel [y]
- Close-mid front rounded vowel [ø]
- Open-mid front rounded vowel [œ]
- Open (low) front rounded vowel [ɶ]
- Open (low) back rounded vowel [ɒ]
- Open-mid back unrounded vowel [ʌ]
- Close-mid back unrounded vowel [ɤ]
- Close (high) back unrounded vowel [ɯ]

Q. Difference between primary and secondary cardinal vowels

The main difference between primary and secondary cardinal vowels is related to lip-rounding as in some languages the feature of lip-rounding is possible for front vowels. By reversing the lip position (in comparison with primary cardinal vowels), the secondary series of vowel types is produced (e.g., rounding the lips for the front vowels).

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Q. Semivowels

Most of the world languages contain a class of sounds that functions in a way similar to consonants but is phonetically similar to vowels (e.g., in English, /w/ and /j/ as in 'wet' and 'yet'). When they are used in the first part of syllables (at onset), they function as consonants. But if they are pronounced slowly, they resemble (in quality) with the vowels [u] and [i] respectively. These sounds are called semivowels which are also termed as approximants today. In French there are three semivowels (i.e., in addition to j and w there is another sound symbolized /ɥ/ and is found in initial position in the word like 'huit' /ɥit/ (eight) and in consonant clusters such as /frɥ/ in /frɥi/ ('fruit'). The IPA chart also lists a semivowel corresponding to the back close unrounded vowel /ɯ/. Like the others, this is classed as an approximant.

Q. Three syllable structure example

Syllable structure could be of three types: 'simple' (CV), 'moderate' (CVC) and 'complex' (with consonant clusters at edges) such as CCVCC and CCCVCC (where V means vowel and C stands for consonant).

Q. What are SAGs/ Secondary articulatory gestures:

'Secondary' articulation is an articulatory gesture with a lesser degree of closure occurring at approximately the same time as another (primary) gesture. It is different than co articulation which is at the same time and of the same value (taking place as an equal level gesture).

Types of SAGs

i. **Palatalization** (can come as short or long question too) is the addition of a high front tongue gesture (as in sound like [i]) to another main (primary) gesture. The diacritic used for palatalization is the small [ʲ] superimposed above another symbol (for primary gesture). The terms palatalization (a process whereby the place of an articulation is shifted nearer to the center of the hard palate) and palatalized (when the front of the tongue is raised close to the palate while an articulatory closure is made at another point in the vocal tract) are sometimes used in a slightly different way. A palatalized consonant has a typical /j/-like (similar to /i/ vowel) quality.

ii. **Velarization** involves raising the back of the tongue (adding the /u/ vowel like quality). It can be considered as the addition of an [u]-like tongue position (but remember that it is without the addition of the lip rounding). A typical English example of velarization is the /l/ sound at the end of a syllable (as in words like kill, pill, sell and will) called velarized or dark /l/ and may be written as [ɫ]. The diacritics for velarization are both [ˠ] and [˞].

iii. **pharyngealization** which is the superimposition of narrowing of the pharynx. The IPA diacritics for symbolizing pharyngealization are [˞] (as for velarization) and [ˤ] (the superimposition of the symbol for pharyngeal sound).

iv. **Labialization** which is the addition of lip rounding (written as [ʷ]) to other primary articulation such as Arabic /tʷ/ and /sʷ/. Nearly all kinds of consonants can have added lip rounding, including those that already have one of the other secondary articulations (such as velarization and palatalization).

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Q. Pitch as a Suprasegmental Feature

As a suprasegmental feature, pitch is an auditory sensation - when we hear a regularly vibrating sound such as a note played on a musical instrument (or a vowel produced by the human voice), we hear a high pitch (when the rate of vibration is high) and a low pitch (when the rate of vibration is low). There are some speech sounds that are voiceless (e.g. /s/), and cannot give rise to a sensation of pitch in this way but the voiced sounds can. Thus the pitch sensation that we receive from a voiced sound corresponds quite closely to the frequency of vibration of the vocal folds.

Q. Write three variables of pitch. 3

- Pitch range,
- height and
- direction

Q. Explain Intonation in simple words.

Intonation refers (very) simply to the variations in the pitch of a speaker's voice (f0) used to convey or alter meaning but in its broader and more popular sense intonation covers much of the same field as 'prosody' where variations in such things as voice quality, tempo and loudness are included. Intonation as a suprasegmental feature performs several functions in a language. Its most important function is to act as a signal of grammatical structure (e.g. creating patterns to distinguish among grammatical categories), where it performs a role similar to punctuation (in written language). It may furnish far more contrasts (for conveying meaning). Intonation also gives an idea about the syntactic boundaries (sentence, clause and phrase level boundaries). The role of intonation in the communication. It is quite important as it also conveys personal attitude (e.g., sarcasm, puzzlement, anger, etc.). Finally, it can signal contrasts in pitch along with other prosodic and paralinguistic features. It can also bring variation in meaning and can prove an important signal of the social background of the speakers.

Q. Explain intonation with reference to syntactic and grammar

Intonation according to grammatical structure Its most important function is to act as a signal of grammatical structure (e.g., creating patterns to distinguish among grammatical categories), where it performs a role similar to punctuation (in written language). It may furnish far more contrasts (for conveying meaning). Intonation also gives an idea about the syntactic boundaries (sentence, clause and phrase level boundaries). It also provides the contrast between some grammatical structures (such as questions and statements).

For example, the change in meaning illustrated by 'Are you asking me or telling me?' is regularly signaled by a contrast between rising and falling pitch. Note the role of intonation in sentences like 'He's going, isn't he?' (= I'm asking you) opposed to 'He's going, isn't he!' (= I'm telling you)

Q. What is praat?

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Praat is a computer program with which you can analyze, synthesize, and manipulate speech, and create high-quality pictures for your articles and thesis. Nowadays most of the research works in phonetics and phonology are based on software like Praat and Wave Surfer.

How to insert a grid text in PRAAT? Write down the steps

Create a text grid:

- In the Praat Objects window, highlight the subject (required) file.
- Annotate > To Text Grid.
- Create two tiers (this will be enough for our purposes). Write 'word segment' (these are two tiers) on the cell named 'All tier names' on the small window.

Q. VOT three types

- negative
- zero
- positive

Q. VOT of /p/ and /ph/

In a voiceless aspirated plosive (such as /p/ there is a delay (or lag) before voicing starts; and, in a voiceless aspirated plosive (e.g., /p^h/), the delay is much longer, depending on the amount of aspiration. The amount of this delay is called Voice Onset Time (VOT) which in relation to the types of plosive varies from language to language.

Q. What steps will you follow to calculate Vot on praat

To calculate the VOT. Record /apa/, /aba/ /ata/, /ada/, /apha/ and /atha/. Zoom in through your stop sounds so that you can analyze the patterns of the stop sounds and find the difference among the three types of VOT (negative, zero and positive). Measure the VOT of each stop and compare voiced/voiceless counterparts (p/b, t/d, k/g). Similarly, zoom in so that you can clearly see the stop closure followed by the beginning of the vowel. You can measure the time between the end of the stop closure (the beginning of the release burst) and the onset of voicing in the following vowel (the onset of regular pitch pulses in the waveform).

Q. Why we have to focus more on volume bar while recording in Praat?

Make sure the volume bar is fluctuating as you record – if it isn't, you're not recording; if you don't see the volume bar at all, you're not speaking loudly enough.

Watch out for clipping. If your recording level is too high and you go into the red on the volume bar, you'll end up with what is called a "clipped" signal; this is very bad for speech analysis!

Q. While recording on Prat, one has to be careful about clipping, explain? (3)

Watch out for clipping. If your recording level is too high and you go into the red on the volume bar, you'll end up with what is called a "clipped" signal; this is very bad for speech analysis.

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Q. Difference Between acoustic and auditory phonetics ....3/ OR What is more authentic in auditory and acoustic analysis.

Acoustic Phonetics is the study of detailed physical properties of sound we produce. It generally uses tools which read the changes in air pressure that the sound creates. Each sound has its different sound quality, which depends on the source filter that is our speech organs. Each sound has its own f0, f1, f2 and f3 (formants), depending on the source modifier. f0 deals with the fundamental frequency, f1 gives the information about the pharyngeal cavity, f2 about the oral cavity and f3 about the position of the lips while the sound was produced.

Auditory phonetics is just the other side of the coin for this study. It deals with the study of these articulated sound characteristics from the perception perspective. Auditory phonetics deals with the listener at a broader aspect. The perceived f0 is measured in terms of pitch and calculated in Mel or bark scales.

Q. Nasal Sounds 3

A nasal consonant is a consonant whose production involves a lowered velum and a closure in the oral cavity, so that air flows out through the nose. Examples of nasal consonants are [m], [n], and [ŋ] (as in think and sing).

Q. Feature hierarchy....3

Feature hierarchy is an important concept in phonetics and phonology which is based on the properties and features of sounds. In a very general sense, a feature may be tied to a particular articulatory maneuver or acoustic property. For example, the feature [bilabial] indicates not only that the segment is produced with lips but also that it involves both of them. Such features (in phonetics and phonology) are listed in a hierarchy with nodes in the hierarchy defining ever more specific phonetic properties

Q. Consonant gestures

In phonetics and phonology, speech sounds (segments) using basic units of contrast are defined as gestures – they are treated as the abstract characterizations of articulatory events with an intrinsic time dimension. Thus sounds (segments) are used to describe the phonological structure of specific languages and account for phonological variation. In this type of description in phonetics and phonology, sounds are the underlying units which are represented by classes of functionally equivalent movement patterns (gestures)

Q. Sonorant/ why sonorant called vowel like sound and how they different from vowel?

Sonorant is vowel-like sounds (nasals and glides). These sounds are called sonorant because they have formants. But they are different from vowels because they generally have lower amplitude; therefore, they behave like consonants.

Q. What is retroflex (3)

Retroflex: This sound is produced when the tongue tip curls against the back of the alveolar ridge. Many speakers of English do not use retroflex sounds at all but it is a common sound in Pakistani languages. They are pronounced by general lowering of the third and fourth formants such as Urdu, Sindhi, Pashto, Balochi and Punjabi.

Q. Stress Timed Languages

Stress timed languages' is a very general phrase used in phonetics to characterize the pronunciation of languages displaying a particular type of rhythmic pattern that is opposed to that of syllable-timed languages. In stress-timed languages, it is claimed that the stressed syllables recur at regular intervals of time (stress-timing) regardless of the number of intervening unstressed syllables as in English. This characteristic is sometimes also referred to as 'isochronism', or isochrony.

Q. Syllable Timed Languages

In syllable timed languages, all syllables tend to have an equal time value (for example, their length or duration) and the rhythm of the language is said to be syllable-timed. In these languages, syllables tend to occur at regular intervals of time with fixed word stress. A classic example is

Q. Japanese Syllables in which all morae have approximately the same duration.

This tendency is contrasted with stress-timing where the time between stressed syllables is said to tend to be equal irrespective of the number of unstressed syllables in between. Czech, Polish, Swahili and Romance languages (e.g., Spanish and French)

Q. Many phoneticians disagree with the basic idea of stress timing value. Write the 3 dimensions they suggest?

Many phoneticians disagree with the basic idea of timing value. They are of the view that there are three dimensions: a. fixed word stress (mainly found in Romance languages), b. variable word stress (mainly found in languages such as English and German) c. fixed phrase stress (phrase as a third possibility as exhibited by Japanese) and they want to categorize languages on the basis of these three patterns.

Q. Glides:

Glides are also the sonorants (vowel-like) sounds as they have similar patterns (have formants). Take the first three formants (F1, F2 and F3) from the middle of the sounds for glides (both for /w/ and /j/) and explore their acoustic correlates. Carefully judge the center of these sounds (the midpoint of [w] and [j]). Analyze that how similar is the formant structure of glides with vowels and nasals. Draw lines to indicate F1, F2, F3 and compare with vowels.

Q. Formants:

Formants come from the vocal tract. The air inside the vocal tract vibrates at different pitches depending on its size and shape of opening. We call these pitches formants. You can change the formants in the sound by changing the size and shape of the vocal tract. Formants filter the original

sound source. After harmonics go through the vocal tract some become louder and some become softer.

Q. Relationship between Formants and Harmonics

Harmonic numbers are different for one type of sounds but the formants are the same. The relationship between the harmonics and the formants is captured in the source-filter model of speech production. The point is that harmonics are related to the laryngeal activity (source) and formants are the output of the vocal tract (filter).

Q. What do the first two formant frequencies tell about vowel?

The first two frequencies are important here. The first formant (F1) is inversely related to the height of a vowel whereas the second formant (F2) is related to the frontness of a vowel sound. When the first two formants are taken, the vowels of a language can be plotted on a chart and the structure is very much related to the traditional description of vowel sounds.

Q. Formants f1 and f2

Formants are the overtone resonances. Acoustically, in order to plot vowels on chart, F1-F2 are very important. We need the wide bands for measuring the formants (which are the important characteristics of sonorant speech sounds – vowels). On spectrogram, formants are thick bands (darkness corresponds to loudness; i.e. the darkest harmonics are the ones that are the most amplified). These amplified harmonics form the formants that are characteristic of sonorant speech sounds.

Q. Phonotactics:

In phonology, phonotactics is the study of the ways in which phonemes are allowed to combine in a particular language. (A phoneme is the smallest unit of sound capable of conveying a distinct meaning.) Over time, a language may undergo phonotactic variation and change. For example, as Daniel Schreier points out, "Old English phonotactics admitted a variety of consonantal sequences that are no longer found in contemporary varieties"

Q. Why do you think teacher are mostly expected to perform action research in ELT. 3

Teachers are expected to facilitate action research which is the most rewarding and productive for their own profession. For example, the phonetics of phonological speech errors if explored and shared by teachers (by investigating their own practices) may lead to a very positive discussion in the academic circles (of research into ELT – SLA). Similarly, topics such as learners' performance and development (e.g., what do good speakers do?) may yield useful results for teachers' community.

Q. Duration of vowel preceding a consonant.

Stop voicing: There are three important acoustic correlates of voicing in stops: the voice bar, VOT, and the duration of the preceding vowel. Record /apa/, /aba/, /ata/, /ada/, /apha/ and /atha/ and for each of the stops in the file, take the three measurements according to the following instructions:

See the voicing or the voice bar by exploring features of stop. We can also explore the features related to the place of articulation (any bilabial feature for /p/ or /b/ in comparison with non-bilabial). Also check the duration of the preceding vowels. Note down the presence of voicing.

Q. Keeping the view of tongue and lips describe (i,e,€,a)?

Part of the tongue - the front, the middle or the back of the tongue may be raised, giving different vowel qualities: compare /æ/ vowel (as in word 'cat') as a front vowel, with the /ɑ:/ vowel (as in 'cart') which is a back vowel. Thirdly, the tongue (and the lower jaw) may be raised 'close' to the roof of the mouth (for close vowels. e.g. /i:/ or/u:/), or the tongue may be left 'low' in the mouth with the jaw comparatively 'open' (as for open vowels e.g., /a:/and /æ/.

Q. Coronal three types

Coronal' articulations can be split into three mutually exclusive possibilities:

1. Laminal (i.e., blade of the tongue),
2. Apical (i.e., tip of the tongue), and
3. Sub-apical (i.e., the under part of the blade of the tongue)

Q. Why air vibrate more than in one way in vocal tract?

Any particle of air, such as that in the vocal tract or that in a bottle, will vibrate in a way that depends on its size and shape. Remember that the air in the vocal tract is set in vibration by the action of the vocal folds (in larynx). Every time the vocal folds open and close, there is a pulse of acoustic energy (activation). Irrespective of the rate of vibration at source (of the vocal folds), the air in the vocal tract will resonate at these frequencies as long as the position of the vocal organs remains the same. Because of the complex shape of the filter (tract), the air will vibrate in more than one way at once.

Q. Ease of articulation

In order to explain the sound patterns of a language, the views of both speaker and listener are considered. Both of them like to use the least possible articulatory effort (except when they are trying to produce very clear speech), and there are a large number of assimilations, with some segments left out, and other reduced to minimum. Thus as peaker uses language with an ease of articulation (e.g., co articulation and secondary articulation). This tendency to use language sounds with maximum possible ease of articulation leads to change in the pronunciation of words.

Q. Explain IPA charts/ Blank cells of IPA

One evidence that the IPA chart is based on linguistic phonetics is the description of the blank cells on the chart (those neither shaded nor containing a symbol) that indicate the combinations of categories that are humanly possible but have not been observed so far to be distinctive in any language (e.g., a voiceless retroflex lateral fricative is possible but has not been documented so far, so it is left blank). The shaded cells, on the other hand, exhibit the sounds not possible at these places. Further, below the consonant chart is a set of symbols for consonants made with different airstream mechanisms (clicks, voiced implosives, and ejectives). All these descriptions reflect the

potentialities of human speech sounds (as a linguistic community) not only showing the possible segments but also the suprasegmental features and points related to the possible airstream mechanisms and even the diacritics for various types co-articulations and secondary articulatory gestures. The IPA chart is carefully documented (by experts) and is continuously revised and updated.

Q. IPA Text in ELT class. (3)

Developing relevant material for the teaching of phonetics and phonology is an important task for aspiring teachers of English language. For example, you can develop your material related to the pronunciation teaching to the learners of English. You can incorporate material related to the IPA text – transcription of the audio (listening) based activities – by involving students on using dictionaries (ideally the phonetic dictionaries) in the classroom.

Q. Experimental Techniques about phonetics

In experimental phonetics and phonology, the studies of sounds include various latest experimental techniques and computer software that are used under carefully designed lab experimentation. It is an important aspect of the application of the latest technology by going beyond the simple acoustics and by working in sophisticated phonetic labs in order to discover the hidden aspects of human speech. For example, questions such as 'How speech is produced and processed?' are the focus of experimental phonetics (explore the speech chain as the beginning of experimental phonetics as mentioned in Chapter 20 by Peter Roach). The latest trends under experimental phonetics include brain functions in speech production and processing (by using the latest equipment – many special instruments such as x-ray techniques), speech errors, neurolinguistics and the topics related to the developments through computers – for speech analysis and synthesis.

Q. Why the English lateral /l/ is called an approximant? 3/ Difference of lateral sounds of Americans and British English.

The only English lateral phoneme, at least in British English, is /l/ with allophones [l] as in led [lɛd] and [ɬ] as in bell[bɛɬ]. In most forms of American English, initial [l] has more velarization than is typically heard in British English initial [l]. In all forms of English, the air flows freely without audible friction, making this sound a voiced alveolar lateral approximant. It may be compared with the sound [ɹ] in red [ɹɛd], which is for many people a voiced alveolar central approximant. Laterals are usually presumed to be voiced approximants unless a specific statement to the contrary is made.

Q. What formant position would you observe against a retroflex sound on its spectrogram.

Retroflex - general lowering of the third and fourth formants

Q. On what basis Akan (language in Ghana) constraints its vowels?

Vowels produced with ATR involve the furthest-back part of the tongue, opposite to the pharyngeal wall, which is not normally involved in the production of speech sounds - also called the radix (articulations of this type may, therefore, be described as radical). ATR (a kind of

articulation in which the movement of the root of tongue expands the front–back diameter of the pharynx) is used phonologically in Akan (and some other African languages)as a factor in contrast of vowel harmony. The opposite direction of movement is called retracted tongue root (RTR).ATR is thus related to the size of pharynx – making the pharyngeal cavity different: creating comparatively large (+ATR: root forward and larynx lowered) and small pharyngeal cavity (-ATR: no advanced tongue root). Akan contrasts between two sets of vowels +ATR and –ATR.

Q. Which varieties of English are called non-rhotic? 3

Non-rhotic (such as Received Pronunciation where /r/ is only found before vowels as in 'red' and 'around').Most American English speakers speak with a rhotic accent, but there are non-rhotic

Q. Trills and Flap. (3)

In the production of trill the articulator is set in motion by the current of air [r]. It is a typical sound of Scottish English as in words like 'rye' and 'row'.

Flap is front and back movement of tongue tip at the underside of tongue with curling behind. It is found in abundance in Indo-Aryan (IA) languages [ɽ]. Typical flap sounds found in IA languages is a retroflex sound and the examples are [ɽ], [ɖ] and [ɳ].

Q. What is Neurolinguistics?

Human language or communication (speech, hearing, reading, writing, or nonverbal modalities) related to any aspect of the brain or brain function. It is a field of interdisciplinary study which does not have a formal existence. Its subject matter is the relationship between the human nervous system and language "The primary goal of the field of neurolinguistics is to understand and explicate the neurological bases of language and speech, and to characterize the mechanisms and processes involve in language use. The study of neuorolinguistics is broad-based; it includes language and speech impairments in the adult aphasias and in children, as well as reading disabilities and the lateralization of function as it relates to language and speech processing." and computer modeling.

Q. Write principles of Features analysis.

1. Contrastive function (how it is different),
2. Descriptive function (what it is) and
3. Classificatory function (based on broader classes of sounds).

Features may also be studied further as a part of language universals and then their role as language specific subsets.

Q. How to become a good teacher and researchers.

Good teachers are expected to be active researchers and therefore busy in updating themselves about the latest researches and teaching methodologies around the world. It is also a pedagogical challenge for teachers to keep themselves updated by exploring pedagogical and technological challenges for ELT experts (in their own contexts and internationally). For example, the aspects

of Task Based Learning and Teaching (TBLT) as a golden method for second language acquisition (SLA) may be effective in Pakistani context if explored by ELT practitioners. Teachers as the agents of change and they must be reading research studies and carry out research by and explore their issues and solutions. A good way is to keep reading teachers' digests and journals and participate in the online discussions by teaching associations.

Q. Plotting vowel on chart

Take the measurement of the first two formants and plot those values on a chart using the Excel spreadsheet. By putting F1 and F2 in separate columns, write the formant values associated with different vowels (giving vowels in the first column, the difference between F2 and F1 in the second column and F1 in the third). After putting the data in Excel sheet, use the Scatter chart from the same spreadsheet. Further in order to make it corresponding with the required values for F1 and F2, reverse the values for both formants (on both axis – Y and X). Now the zero for bothF1 and F2 is at the right corner. Watch the video and you will find how F1 is inversely related to the height of the vowel and the difference between F2 and F1 to the frontness of the vowels. Once completed, export the chart to your Word document and give it the number and title accordingly.

(05 Marks Questions)

Q. Mechanism of source filter/ Role of vocal folds and vocal tract in Source filter theory.

In this theory, the tract is represented using a source-filter model and several devices have been devised to synthesize speech in this way. The idea is that the air in the vocal tract acts like the air in an organ pipe, or in a bottle. Sound travels from a noise-making source (i.e., the vocal fold vibration) to the lips. Then, at the lips, most of the sound energy radiates away from the lips for a listener to hear, while some of the sound energy reflects back into the vocal tract. The addition of the reflected sound energy with the source energy tends to amplify energy at some frequencies and damp energy at others, depending on the length and shape of the vocal tract. The vocal folds (at larynx) are then a source of sound energy, and the cavity (vocal tract - due to the interaction of the reflected sound waves in it) is a frequency filter altering the timbre of the vocal fold sound. Thus this same source-filter mechanism is at work in many musical instruments. In the brass instruments, for example, the noise source is the vibrating lips in the mouthpiece of the instrument, and the filter is provided by the long brass tube.

Q. State interesting facts about CV (5 marks)

The CV pattern (where one consonant is found at the onset followed by a vowel as its peak) of syllable is found in all languages of the world. It is the universal pattern of syllable (Max Onset C) and is encouraged by all human languages in abundance. There are languages which only allow CV templates of syllables (e.g., Honolulu - CVCVCVCV and Waikiki - CVCVCV). Interestingly, it is also found in the nicknames of the almost all languages of the world: kami, nana, baba, papa, mani, rani, etc. As a part of their L1 acquisition, children first acquire the CV pattern of their mother tongue.

Words with consonant clusters, /1/2 / 3phoneme pattern:

One phoneme pattern V	I, oh, owe
Two phoneme pattern CV	to, be, see
Three phoneme pattern CVC	cat, dog, run
Four phoneme pattern CCVC	stick, click, brick
Five phoneme pattern CCVCC	brisk, treats, speaks
Six phoneme pattern CCCVCC	streets, strand, strips
Seven phoneme pattern CCCVCCC	strengths

Also possible: CCV (try) CCCVC (stroke), CCCV (straw), VCC (eggs) CVCC (risk), CVCCC (risks).

Q. Note on suprasegmental feature (5 marks)

Supra means 'above' or 'beyond' and segments are sounds (phonemes). Suprasegmental is a term used in phonetics and phonology to refer to a vocal effect (such as tone, intonation, stress, etc.) which extends over more than one sound (segment) in an utterance. Major suprasegmental features include pitch, stress, tone, intonation or juncture. These features are meaningful when they are applied above segmental level (on more than one segment). Phonological studies can be divided into two fields: segmental phonology and suprasegmental phonology. Suprasegmental features have been extensively explored in the recent decades and many theories have been constituted related to the application and description of these features.

Q. Features of syllable (5marks)

Syllables constitute words, phrases and sentences through the combination of their prosodic features: loudness — stress, pitch — tone, duration — length and tempo. Syllables may be stressed, unstressed,, high, mid, low, rising, falling, long, short. OR From the speech production point of view, a syllable consists of a movement from a constricted or silent state to a vowel-like state and then back to constricted or silent state. From the acoustic point of view, this means that the speech signal shows a series of peaks of energy corresponding to vowel-like states separated by troughs of lower energy (sonority).

Q. Why acoustic properties of consonants complicated?

The acoustic properties (structure) of consonantal sounds are usually more complicated than that of vowels. Usually, a consonant can be said to be a particular way of beginning or ending a vowel sound because during the production of a consonant there is no distinguishing feature prominently visible. There is virtually no difference in the sounds during the actual closures of voiced stops [b, d, g], and absolutely none during the closures of voiceless stops [p, t, k], because there is only silence at these points. Each of the stop sounds conveys its quality by its effect on the adjacent vowel. We have seen that during a vowel such as [u], there will be formants corresponding to the particular shape of the vocal tract. In the case of consonants, these changes are not really distinguishable (particularly for obstruent). Although there are some consonantal sounds which

have vowel like structure; therefore, their acoustic features are somehow similar to vowels (in the case of nasal consonants, approximants and glides) but most of the consonants have totally different acoustic features.

Q. Nasal Stop (5)

Like stops, nasal can also occur voiced or voiceless (for example, in Burmese, Ukrainian and French) though in English and other most languages nasals are voiced. As voiceless nasals are comparatively rare, they are symbolized simply by adding the voiceless diacritic [ ] under the symbol for the voiced sound. There are no special symbols for voiceless nasals and it is written as /m / - a combination of the letter for the voiced bilabial nasal and a diacritic indicating voicelessness.

Q. Vowel recording process

For exploring the acoustics of vowels, we need to record vowels and explore their properties. The eight vowels from American English. These vowels are: heed, hid, head, had, hod, hawed, hood and who'd. When you are done with the recording, get ready for measuring the following three things: intrinsic pitch, spectral make up (formants) and plotting them in excel sheet (and finally exporting them to your Word document). Now, record yourself saying the words. Take a quick look at your vowels in the Edit window, and make sure you can clearly see the vowel formants. If you have trouble seeing them, you can go back to the previous labs and learn it again. While doing this, please make a note of it on your worksheet.

Q. Harmonics....5

Harmonics are the multiple integers of the fundamental frequency which are basically the result of vocal fold vibration (complex wave). It is important to note down that when our vocal folds vibrate, the result is a complex wave, consisting of the fundamental frequency plus other higher frequencies, called harmonics. As already mentioned, to see harmonics, we need to look at a narrow-band spectrogram, which is more precise along the frequency domain than the default wide-band spectrogram.

Q. Measuring the harmonics: /Steps to follow harmonics (5)

- Display a narrow-band spectrogram:
- Go to: Spectrum > Spectrogram settings.
- Change the window length to 0.025s – the default window length is 0.005s (wide-band spectrogram) - this changes
- The spectrogram dramatically!
- Looking at each vowel, notice the grey horizontal bands: these correspond to harmonics. For each vowel, measure
- The frequencies of the first 3 harmonics (H1-H3) and the 10th harmonic (H10).
- Click on the center (horizontally) of each harmonic in the center of each vowel.
- A red horizontal bar should appear with the frequency value on the left side of the window in red.

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Q. Write a note on structure of syllable (5)

There are different modes and structures for syllable structure and languages are labeled as per their syllabic templates. Consonant sequences are called clusters (e.g., CC – two consonants or CCC – three consonants). Most of the phonotactic analyses are based on the syllable structures and syllabic templates. On the basis of these consonant clusters, mainly three types of syllabic patterns are considered among languages; simple – moderate – complex (on the basis of consonants clusters at edges: onset and coda).

Examples: Simple CV Moderate CVC(G)(N) (G for Glide and N for Nasal – specific Cs)

Complex CCVCC – CCCVCC (bipartite CC and tripartite CCC)

Q. lexical stress....5

Lexical stress, or word stress, is the stress placed on a given syllable in a word. The position of lexical stress in a word may depend on certain general rules applicable in the language or dialect , but in other languages, it must be learned for each word, as it is largely unpredictable. In some cases, classes of words in a language differ in their stress properties. Lexical stress is basically related to the primary stress applied at syllable level (when only one syllable is stressed) that has the ability to change the meaning and the grammatical category of a word as in the case of 'IMport' (noun) and 'imPORT' (verb).

Q. Emphatic Stress/ Sentence level stress

Sentence stress is applied on one word (rather than a syllable) in a sentence thus making that word more prominent (stressed) than the rest of the words in the sentence. This type of stress has its role in intonation patterns and rhythmic features of the language showing specific emphasis on the stressed word (which may be highlighting some information in the typical context). In order to perceive the nature of sentence level stress, read the following sentences with shifting the stress accordingly and judge the shift in emphasis (and its role in the context):

- Did YOU drive to Peshawar last weekend?
- Did you DRIVE to Peshawar last weekend?
- Did you drive to PESHAWAR last weekend?
- Did you drive to Peshawar LAST weekend?

Q. Vowel qualities....5

There are two features of vowel quality (i.e., height and backness of the tongue) that are used to contrast one vowel with another in nearly all languages of the world. But there are four other features that are used less frequently and not all languages exhibit them. They include 'lip-rounding', rhotacization, nasalization and advanced tongue root (ATR).

Features of the acoustic correlates

- Height - frequency of formant one (inversely related to F1)
- Backness - difference between frequencies of F2 and F1

- ♣ Rhotacization - frequency of formant three
- ♣ Rounding - lip position (rounded, half rounded or neutral)
- ♣ ATR - width of the pharynx (ATR or RTR)
- ♣ Nasalization - position of the soft palate

Q. Nasal Formants

Formants for nasal sounds are also important for acoustic analysis. Measure the first three (F1, F2 and F3) formants of nasals from the file (use the already learnt way of measuring formants). Remember that nasals have very distinctive waveforms (different than that of vowels) as they have distinctive forms of anti-formants (bands of frequencies damped) and formant transition. When you are done with the measurement, try to answer the following questions:

1. Are there any systematic patterns across nasals?
2. Is there one formant with a similar frequency for all places of articulation?
3. Is there one formant that has much higher amplitude than the others across nasals?
4. Do you see any overall differences between the nasals on the one hand and [a] on the other?

Q. In order to Formant automatically, what three steps will you follow, elaborate?(5)

- ❖ Display the formant track: Formant > Show formants.
- ❖ Place your cursor in the middle, stable portion of the vowel.
- ❖ Go to Formant > Formant listing: a box will appear with the time point at which the measurement was taken, and the first four formants.

Q. Write a note on Linguistic Phonetics / phonetics of community

Linguistic phonetics is an approach which is embodied in the principles of the International Phonetic Association (IPA) and in a hierarchical phonetic descriptive framework that provides certain basis for formal phonological theory. Linguistic phonetics answers a number of questions related to the possible ways of articulatory unified phonetics and phonology and from the perspective of cognitive phonetics focusing on speech production and perception and how they shape languages as a sound systems. The idea is mainly related to the overall ability of human beings to produce sounds (as a community and irrespective of their specific languages) and then the representation of their shared knowledge (as considered by the IPA in its charts) for formal phonetic and phonological theories

Q. Acceptable and unacceptable sequences

It has often been found that languages do not allow all phonemes to appear in any order (e.g., a native speaker of English can figure out fairly easily that the sequence of phonemes /streŋθs/ makes an English word (‘strengths’) and that the sequence /bleidg/ would be acceptable as an English word ‘blage’, although that word does not happen to exist, but the sequence /lvm/ could not possibly be the part of an English word).

Q. Lack of invariance 5

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The research and application of speech perception must deal with several problems which result from what has been termed the lack of invariance. Reliable constant relations between a phoneme of a language and its acoustic manifestation in speech are difficult to find. This 'lack of phonetic invariance' provides us with many reasonable justifications as it has posed an important problem for phonetic theory as we try to reconcile the fact that shared phonetic knowledge can be described using the IPA symbols and phonological features with the fact that the individual phonetic forms that speakers produce and hear on a daily basis span a very great range (of varieties).

Q. Name some materials that can assist in the teaching of the language skills. 5

Developing relevant material for the teaching of phonetics and phonology is an important task for aspiring teachers of English lang.

1. Explore already developed material available online from various sources (such as British Council and other teacher resource centers); however, you must also be able to develop your own material (as specifically required by your students).
2. You can develop your material related to the pronunciation teaching to the learners of English.
3. You can incorporate material related to the IPA text – transcription of the audio (listening) based activities – by involving students on using dictionaries (ideally the phonetic dictionaries) in the classroom.
4. Movies and documentaries (such as from BBC - CNN - National Geographic channels) may also serve as very effective resources for the teaching of pronunciation.
5. Finally, the real life material (for listening) and writing interaction from everyday language may also yield tremendous results. The focus of material development should always be the enhancement of the proficiency level of students.

Q. P&P Research as the Part of ELT

In Pakistan Phonetics and phonology is a very potential area for research to be carried out in Pakistani context. In applied phonology, many areas can be explored; for example, issues faced by Pakistani learners of English may be studied. Similarly, the pronunciation issues of Pakistani learners are potential area through which the difficulties faced by Pakistani students may be addressed. Also, researchers can explore and document the features of Pakistani English based on their phonological features in order to get the Pakistani variety of English recognized. Other problematic areas may also include: segmental and supra segmental features (such as stress placement, intonation patterns and syllabification and resyllabification of English words by Pakistani learners. Contrastive analysis (between English phonology and the sound systems of the regional languages of Pakistan can also be carried out by the researchers. We can also think about exploring the consonant clusters and interlanguage phonology from second language acquisition point of view. While focusing on ELT as the part of applied linguistics, studies may also be carried out on Pakistani variety of English (development of its corpora, deviation from the standard variety (RP), its specific features, etc.).

Q. Speaker styles

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A complete range of a speaker's vowel qualities may be considered as representative of the speaker's personal features which, in turn, may be compared with the formant frequency of each vowel (with the total range of that formant in that speaker's voice). But this is true that the phoneticians are still working with comparing the acoustic data of one individual with the other and improve further the system of speech recognition. Experts of applied phonetics and computer speech technology are trying to understand the complexity of speech – synthesis systems and improve it.

Q. VOT (5)

Voicing is a feature of some of the sounds we make. If we hold our fingers lightly against the front of our throat and make the sound sssssss, and then go zzzzzzzz – we will feel buzz for the second one. That's our vocal folds vibrating really quickly. There are lots of minimal pairs like this in English - s/z are fricatives, but there are also stops, like t/d and p/b. For stops, the voice onset time (VOT) is the relationship between when you open your articulators and when those vocal folds start buzzing. Some stops will have the voicing start before the release of the closure, known as a negative VOT, aspirated consonants (a bit of air after the release) with a voiced sound after result in a positive VOT, and those situations where the voicing and opening occur at the same time are known as tenuis VOT just to sound fancy. The VOT of sounds varies across languages.

Q. Explain with reference to the division of sound into supra laryngeal n lyrangeal. 5

Sounds are divided in terms of their supra-laryngeal and laryngeal characteristics, and their airstream mechanism. The supra-laryngeal characteristics can be further divided into those for place (of articulation), manner (of articulation), the possibility of nasality, and the possibility of being lateral. Thus, these features are used for classifying speech sounds and describing them formally.

Q. Importance of Spectrograms

1. Using Praat (or any other software) and spectrogram is particularly useful when a researcher is working on a problem related to the nature (physical properties) of a sound (e.g., is it a phoneme or allophone?).
2. It increases our understanding of the speech sounds and their behavior in different forms (in isolation or as the part of connected speech).
3. Practice on spectrogram gives us the opportunity to learn about the characteristics of speech sounds.
4. It is also important for experts who are working on phonetic aspects of speech as signal processing.
5. These are also used as the part of techniques in speech recognition.

Q. What is rhoticization?

Give examples./Define rhotacized how it is produced a sound. In the description of vowel quality, rhotacization (or rhotacized vowel) is a term which is used in English phonology referring to dialects or accents where /r/ is pronounced following a vowel, as in words 'car' and 'cart'. Thus

varieties of English are divided on the basis of this feature - varieties having this feature are rhotic (in which /r/ is found in all phonological contexts) while others (not having this feature) are non-rhotic (such as Received Pronunciation where/r/ is only found before vowels as in 'red' and 'around'). Similarly, vowels which occur after retroflex consonants are sometimes called rhotacized vowels (they display rhotacization). It is important to mention that while BBC pronunciation is nonrhotic, many accents of the British Isles are rhotic, including most of the south and west of England, much of Wales, and all of Scotland and Ireland. Most American English speakers speak with a rhotic accent, but there are non-rhotic areas (e.g., the Boston area, lower-class of New York and the Deep South).

Q. Describe two reasons why phonetics of the community is considered for phonetic description.5

Firstly, individual speakers differ in interesting ways (two native speakers of a language will always speak with some variations). The description of the phonetics of the individual involves describing the phonetic knowledge and skills related to the performance of language. It is possible that certain aspects of the phonetics of the individual can be captured using IPA transcription but others are not compatible with it (such as his private knowledge and its performance and the role of memory and experience).Secondly, the phonetics of the individual is usually not the focus of the linguist in speech elicitation, and it is difficult to describe even with spectrograms of the person's speech. Although, the phonetics of the individual is the focus of much of the explanatory power of phonetic theory but for general phonetic description we need to focus on the phonetics of the community.

Q. How are the oral stops produced? Provide IPA symbols for English oral stops any three. 5

In phonetics, a stop, also known as a plosive or oral occlusive, is a consonant in which the vocal tract is blocked so that all airflow ceases.

The occlusion may be made with the tongue blade ([t], [d]) tongue body ([k], [g]), lips ([p], [b]), or glottis ([ʔ]).

Stops contrast with nasals, where the vocal tract is blocked but airflow continues through the nose, as in /m/ and /n/,and with fricatives, where partial occlusion impedes but does not block airflow in the vocal tract.

Q. Name the five major features based on the major regions of vocal tract. 5

The five features in total (i.e., Labial, Coronal, Dorsal, Radical, and Glottal).The first three of these features are related to tongue position whereas 'Radical' is a cover term for [pharyngeal] and [epiglottal] articulations made with the root of the tongue. The feature of 'Glottal', on the other hand, is based on being [glottal], to cover various articulations such as [h]. If we are to have a convenient grouping of the features for consonants, we have to recognize that Supra Laryngeal features must allow for the dual nature of the actions of the larynx and include Glottal as a place of articulation. Remember that a sound may be articulated at more than one of the regions Labial,

Coronal, Dorsal, Radical, and Glottal. Within the five general regions, 'Coronal' articulations can be split into three mutually exclusive possibilities: Laminal (i.e., blade of the tongue), Apical (i.e., tip of the tongue), and Sub-apical (i.e., the under part of the blade of the tongue). Thus the major regions may be subdivided into sub regions on the basis of their features.