CHAPTER-4

SEGMENTS: VOWELS AND CONSONANTS

4.0 SEGMENTS

Segments are generally divided into two categories vowels and consonants. The main difference between a vowel and a consonant is one of sonority; vowels are those speech sounds which have maximum carrying power, but certain consonants, such as /l/ and /m/ also have considerable carrying power, so that a definition of a vowel must be such that it does not include these sonorous consonants.

In ordinary speech, a vowel is a voiced sound in the pronunciation of which the air passes through the mouth in a continuous stream, there being no obstruction and no narrowing and thus there is no closure and no audible friction. All other sounds are consonants.

4.1 VOWELS

4.1.1 Description of vowels:

During the articulation of vowel sounds, the lung air escapes through the mouth without any friction. This is because during the articulation of vowels. There is no obstruction in the mouth. Vowels are therefore articulated with a stricture of open
approximation. That is to say, the active articulator is raised in the direction of the passive articulator in such a way that there is a sufficient gap between them to allow the air to escape freely and continuously, without any friction. For the description of vowels, following criteria could be taken into account:

a. The Position of the Soft Palate

Whether the velum is raised to produce oral vowels, or lowered to produce nasalized vowels. This does not need to be stated every time; by convention, it is understood that, unless otherwise stated, the soft palate is in its raised position so that the nasal cavity is shut off and therefore the vowel produced is oral, not nasalized.

b. The Shape Assumed by the Lips

The lips can assume a number of positions; spread; as for the vowel in the word bead; neutral, as for the vowel in bird; open for the vowel in bard; open rounded for the vowel in hot; and close rounded for that in hoot. It is common practice, however, to regard the spread, neutral and open positions as unrounded and the other two positions are open-rounded and close rounded.

c. The Shape Assumed by the Tongue

The tongue, being the most flexible organ of speech, can assume virtually a limitless number of shapes, every change in its
shape resulting in a change in the quality of the sound produced. Thus the differences in quality between the vowels in these words beat, bit, bet and bat, for example, are mainly the differences caused by the assumption of different shapes of the tongue.

4.1.2 Naming of vowels:

Vowel segments are more difficult to describe and classify than consonant segments. All consonant segments are made with a stricture involving contact of relatively large areas of both active and passive articulators. On the other hand, vowel segments, being made with the stricture of 'open approximation', the articulators involve little contact and sometimes none at all.

The distinctive quality of sound of any vowel segment results from the general shape of the mouth and throat during its production. The mouth and throat together form a tube-shaped cavity which starts at the larynx and ends at the lips, and the configuration of this tube is called the vocal tract which is moulded by the action of these two articulators - the action of the tongue and the action of the lips. The tongue assumes a large number of very varied postures and shapes in order to produce different vowel segments, but in all these positions the upper surface of its main body is always found to be convex; the tongue always makes a 'hump' in the mouth. If, for any given vowel segment, one can state
the whereabouts during its production of the highest point in the mouth of the hump of the tongue, location of the highest point of its curved upper surface is therefore a means of describing simply and briefly for any given vowel.

In order to say whereabouts, this highest point of the tongue lies in the mouth and locates it on two axes: one horizontal, from front to back of the mouth, and the other vertical, from the floor of the mouth to its roof. However, it is usually found sufficient to have four points on the vertical axes, and three on the horizontal. The four vertical points, starting with the tongue at the greatest distance from the floor of the mouth and descending from there, are called:

- close
- half-close
- half-open
- open

In a close vowel there is contact of the sides of the tongue with the upper back teeth and the sides of the roof of the mouth, though the stricture is of 'open approximation' and there is no audible friction. An example of close vowel in the English word is see. In an open vowel, there is no contact of articulators. An example of an open vowel in the English word is far.

The three horizontal points are called:
front
central
back.

'Front' lies beneath the hard palate, 'back' beneath the soft palate, and 'central' lies below where they meet. The vowel in see is a front vowel; that in far is a back vowel: the first vowel in attain is a central vowel.

These two axes, the vertical and the horizontal give two dimensions of classification for vowels, and similar to the dimensions of 'manner' and 'place' which are used for classifying consonants. The four points on the vertical axes and the three on the horizontal axis, when combined together, twelve different locations in the mouth for the highest point of the tongue.

The posture of the lips provides a third dimension of classification for vowel segments. There are two categories- rounded, when the corner of the lips are brought forward, and unrounded, when the corner of the lips are pulled back. The vowel in the English word too is a rounded vowel, that in see an unrounded vowel.

These three dimensions, therefore, give a system of three-term labels for identifying vowel segments.

The vowel in too is a close back unrounded vowel; that in
French lune is a close front rounded vowel. It can be seen that the order of terms in these labels is: (a) highest point of tongue, vertical axes; (b) highest point of tongue, horizontal axes; (c) lip posture.

4.1.3 Voiceless vowels:

Vowels are usually thought of as being essentially voiced and the etymology of the word ultimately derived from the Latin vox, 'voice'. Voiceless vowels may be heard in many languages. In English for example, the first vowel in the word potato, or the vowel of the word to in come to tea, or I'm going to town, are often pronounced without vibration of the vocal cords in normal conversational speech. In French also, the final vowels of intend, tant pis, or c'est tout, when they occur in conversation before a pause, are usually voiceless. Voiceless vowels are even more common in other languages, for instances in Portuguese, and in a number of American Indian languages.

A vowel may also, of course be whispered. In ordinary whispering, using the word in its popular sense, all vowels are whispered in the technical sense. They are also reported to occur in normal speech in some languages. The so-called aspirate, the sound which in English and many other languages corresponds to the letter h, is in fact a voiceless vowel. That h which is popularly called a consonant, is from the phonetic point of view a voiceless
vowel segment illustrates the ambiguous nature of the traditional terms 'vowel' and 'consonant'. It is nevertheless the case that in a word like hat, the articulatory position of the vowel is more or less assumed at the very beginning of the word, but the glottis is open briefly at the start of the chest pulse, before it assumes the position for voice: in other words, hat starts with a voiceless vowel, immediately followed by a voiced one. In fact the letter h when it is pronounced in English, represents a voiceless version of the vowel which follows it, as in who, hit, heat, heart, hurt, and so on.

Very often also, for an h between two vowel segments, the whisper position of the glottis is combined with that for voice, the vocal cords vibrating along part of their length and being merely brought close together along the rest. In this case, the resulting segment is usually called a voiced h. This sound occurs in all positions, initial and other, in words in Czech, Egyptian colloquial Arabic, and other languages.

In some languages, voiceless vowels occur following a corresponding voiced vowel. Scots, Gaelic, except in its eastern dialects; Icelandic; and some American Indian languages provide good example of this.

4.1.3 Diphthongs:

A diphthong is a glide from one vowel to another, and the
whole glide acts like one of the long, simple vowels. It begins with one vowel and gradually changes to another without any break between the two vowels within one syllable.

In many languages there are vowel segments whose quality is not constant: it changes continually while the vowel is being uttered. English has a number of such vowels. If the vowels of the two words gnaw and now, as pronounced by nearly all English speakers, are compared, it can be observed that the first has a vowel of unchanging quality, which can be prolonged at will; whereas in the course of pronouncing the second, a change takes place which is obvious to both the ear and the eye; the quality of the sound is not the same at the end as it was at the beginning, and the lips can be seen to have moved. Similarly in the word eye, a change of sound is accompanied by a change in the position of the tongue. In both cases, the change in sound and the movement of the tongue or lips or both continues throughout the vowels.

A diphthong may be described and classified in terms of its beginning and ending points, using the categories for monophthongs, with the assumption that the articulators, in their movement, take the shortest path between these points. Thus the diphthong in the word noise starts in a half-open back rounded position, and the tongue and the lips then move immediately to a half-close front unrounded position.
A diphthong can be diagrammatically represented using the vowel quadrilateral. The starting point is usually marked with a dot or a across and the direction in which the tongue moves is marked with an arrow.

4.2 CONSONANTS

4.2.1 Description of Consonants:

Consonant is a segment which occupy a marginal position in a syllable. It is a point in the constantly changing stream of speech. One can arrive at an adequate description of a consonant segment by answering the following questions about it.

(i) What is the airstream mechanism?

(ii) Is the airstream ingressive or egressive?

(iii) What is the state of the glottis?

(iv) What is the position of the velum?

(v) What is the active articulator?

(vi) What is the passive articulator?

(vii) What is the degree and nature of the stricture?

(i) The Air-stream Mechanism: All speech sounds (vowels as well as consonants) are produced with a pulmonic/glottalic/velaric air-stream mechanism (see Chapter-2).
(ii) See Chapter-2:

(iii) The State of the Glottis: Speech sounds can be classified as voiced or voiceless, depending upon the state of the glottis. If the vocal cords are wide apart and the glottis is wide open, resulting sounds are voiceless or if the vocal cords are kept loosely together and they vibrate the resulting sounds are voiced.

(iv) The Position of the Soft-Palate: Speech sounds can be classified as oral or nasal, depending upon whether the soft palate is raised so as to shut off the nasal passage of air and produce oral sounds or it is lowered to open the nasal passage of air along with an oral closure to articulate nasal sounds. Sounds can also be nasalised if the soft palate is lowered and there is oral opening simultaneously so that the lung air passes through the oral as well as nasal passage of air.

(v) The Active Articulators: The lower lip and the tongue are the active articulators.

(vi) The Passive Articulators: The upper lip and the entire roof of the mouth are the passive articulators.

(vii) Nature of the Stricture: The term ‘stricture’ refers to the way in which the passage of air is restricted by the various organs of speech. Here are the various types of strictures in details:
a. **Complete Closure and Sudden Release:** Sounds produced with a stricture of complete closure and sudden release are called plosives. The sounds /p, b, t, d, k, g/ are plosives.

b. **Complete Closure and Slow Release:** Sounds that are produced with a stricture of complete closure and slow release are called affricates. /tʃ/, /dʒ/ are affricate sounds.

c. **Complete Oral Closure:** Sounds that are articulated with a stricture of complete oral closure are called nasals. /m/, /n/ and /ŋ/ are nasal consonants.

d. **Intermittent Closure:** Sounds that are articulated with a stricture of intermittent closure are called trills or rolled consonants. /r/ sound is a trill or rolled consonant.

e. **Close Approximation:** Sounds that are articulated with a stricture of closure approximation are called fricatives. /f, v, θ, ð, s, z, ʃ, h/ are fricatives.

f. **Partial Closure:** Sounds that are articulated with a stricture of complete closure in the centre of the vocal tract but with the air escaping along the sides of the tongue without any friction are called lateral, /l/ is a lateral sound.

g. **Open Approximation:** Sounds that are articulated with a stricture of open approximation are called frictionless continuants,
e.g. /r/ semivowels, e.g. /j, w/ and vowels.

4.2.2 Naming of Consonants:

Classification by place and manner enables one to give brief descriptive names to typical consonant segments. According to this system of naming, a noun identifying the manner (such as plosive, click, implosive, nasal, trill, flap, lateral, fricative and so on) is preceded by an adjective identifying the place. The adjectives referring to place are taken from the Latin names for the articulators. In nearly all cases, it is the passive articulator which provides the adjective; thus the adjective 'labial' is used when the passive articulator is the upper lip; 'dental' is used when the passive articulator is the hard palate; velar is used when the passive articulator is the upper front teeth; 'alveolar' is used when the passive articulator is the teeth ridge; 'palatal' is used when the passive articulator is the hard palate; 'velar' is used when the passive articulator is the velum; pharyngeal is used when the passive articulator is the back wall of the pharynx.

Since the adjective usually refers to the passive articulator, it is taken for granted that the active articulator is the one which lies immediately opposite it when the vocal organs are at rest.

In certain types of stricture, the active and passive articulators are organs which do not lie, when they are at rest, immediately
opposite each other; the stricture is then said to result from a
displaced articulation, and some adjective which is more specific
than one indicating only the passive articulator must be used to
refer to it. Segments so made are common in the languages of
India, and in many other parts of the world also.

When during the production of a segment, the uvula is made
to vibrate against the back of the tongue, the adjective ‘uvular’ is
used to identify the place of production. The same adjective is also
used for consonants in the production of which the root of the
tongue is the active articulator, and the very back of the velum,
including the uvula is the passive one. An example of such segment
is the consonant [q] in classical Arabic.

In order to make a brief descriptive names of this sort
adequate, the combination of adjective, referring to ‘place’ and noun
referring to ‘manner’ must be preceded by a further adjective,
making clear the state of the glottis. Thus one can say that the
word “theme” begins with a voiceless dental fricative and ends with
a voiced (bi-) labial nasal; “light” begins with a voiced alveolar
lateral and ends with a voiceless alveolar plosive; and so on.

Each of these brief descriptive names therefore consists of
three terms, two adjectives and a noun, corresponding to three
‘dimensions’ of classification and such three-term labels are
sufficient to identify most consonant segments for many, perhaps most purposes; but one does not provide anything like a complete description of how the vocal organs form the consonant in question. More precise descriptions can be obtained by adding to the number of ‘dimensions’ of classification. Thus, in addition to the dimensions of place, manner, and voicing, it may sometimes be important to specify the shape of the active articulator which gives a fourth dimension of classification. The shape of the articulator is often the chief difference between the initial consonant of the English word ‘sip’ and that of the English word ‘ship’. With many speakers, both can fairly be described as voiceless alveolar fricatives, but the former is made with a groove, from front to back, in the articulator. The two can then be distinguished from each other by calling the former voiceless grooved alveolar fricative.

When discussing dental and alveolar consonant segments, it is also sometimes necessary to specify explicitly the active articulator, which is usually implicit in the adjective for ‘place’ and taken as understood. This is because both “the point of the tongue” and “the blade of the tongue” may be supposed to lie, when in a position of rest, beneath the upper teeth and the teeth ridge. Therefore a consonant described simply as dental may be made with either the point or the blade of the tongue articulating against the upper teeth, and similarly a consonant described simply
as dental may be made with either the point or the blade of the
tongue against the teeth-ridge; very often one does not need to say
specifically which of the two is the case. However, /s/ and /ʃ/
sounds, are both alveolar, can be made in either way and sometimes
it is an advantage to be able to draw attention to whether it is the
point or the blade that is being used. One can do this by employing,
the adjective “apical” to mean that the point of the tongue is the
active articulator, and the adjective “laminal” to mean that the
blade of the tongue is the active articulator. The following
convenient compound adjectives, identifying both articulators at
once may be used in three term labels instead of the simple dental
and alveolar when necessary; apico-dental, lamino-dental, apico-
alveolar, lamino-alveolar. Some English speakers use apico-
alveolar /t/ and /d/ sounds, while others use lamino-alveolar ones.
The /t/ and /d/ sounds of most French speakers are lamino-
dental.

The following are examples of how three-term labels are applied
to various consonant segments;

/f/ in English word “fan” is a voiceless labio-dental fricative.

/l/ ll in Welsh word “llan” is a voiceless alveolar fricative lateral.

/ŋ/ gn in French word “Montagne” is a voiced palatal nasal.

/ʃ/ in Czech name “Dvořák” is a voiced alveolar fricative trill.
/tʃ/ in Scottish word “loch” is a voiceless velar fricative.

/h/ in the Arabic name “Mohammad” is a voiceless pharyngeal fricative.

4.2.3 (A) Place of Articulation:

The place of articulation of a consonant is determined by the passive articulator(s) involved in the production of it, and for this reason, the sound is also named after the passive articulator. Following are the most commonly known places of articulation:

a. **Bilabial**- The two lips are the articulators /p, b, m/ are bilabial sounds.

b. **Labio-dental**- The active articulator is the lower lip and the passive articulators are the upper front teeth, /f, v/ are the labio-dental sounds.

c. **Dental**- The tip of the tongue is the active articulator and the upper front teeth are the passive articulators. /θ, ð/ are the dental sounds.

d. **Alveolar**- The tip or the blade of the tongue is the active articulator and the teeth ridge is the passive articulator. /t, d, n, s, z, l/ are the alveolar sounds.

e. **Post-alveolar**- The tip of the tongue is the active articulator
and the part of the roof of the mouth that lies immediately behind the teeth ridge is the passive articulator, /r/ is an example of post alveolar sound.

f. **Palato-alveolar**- The tip of the tongue is the primary active articulator and the teeth ridge is the primary passive articulator. Front of the tongue is the secondary active articulator and hard palate is the secondary passive articulator. /tʃ, dʒ, ʃʒ/ are the palato-alveolar sounds.

g. **Retroflex**- The curled back tip of the tongue is the active articulator and the hinder part of the teeth ridge is the passive articulator. /τ, d, ŋ/ are some examples of retroflex consonants, most commonly used in Indian languages.

h. **Palatal**- The front of the tongue is the active articulator and the hard palate is the passive articulator /j/ is an example of a palatal sound.

i. **Velar**- The back of the tongue is the active articulator and the soft palate is the passive articulator. /k, g/ are velar sounds.

j. **Uvular**- The rear part of the back of the tongue is the active articulator and the uvula is the passive articulator. The initial sound in the Urdu word ‘pen’ is an example of a uvular sound.

k. **Glottal**- Glottal sounds are produced at the glottis and the
two vocal cords are the articulators, /h/ is an example of a glottal sound.

B. Manner of Articulation- The manner of articulation specifies the kind of closure or narrowing involved in the production of a sound. No consonant sound is fully identified, or described, without stating the manner of its articulation.

a. Plosive- There is, first, a complete closure of the passage of air at some point in the vocal tract, air pressure is built up behind the closure. The closure is then suddenly removed, causing, in the process, a sudden release of the blocked air with some explosive noise. /p, b, t, d, k, g/ are plosive consonants.

b. Affricate- Affricates are produced in three stages, the first two of which are the same as for plosives - a complete closure of the air passage followed by the building up of pressure behind the closure. The third stage is different since the passive articulator is removed slowly from the active articulator resulting into slight friction due to the slow release of the blocked air. English /tʃ,dʒ/ are affricate sounds.

c. Nasal- In the production of nasals, there is a closure only of the oral passage, while the nasal passage remains open. The lung air can thus pass freely through the nose. /m,n,ŋ/ are nasal sounds.
d. **Roll**- The tip of the tongue taps against the alveolar ridge or the uvula against the back of the tongue, several times, so that the air passes only intermittently between the articulators, /r/ is a roll sound.

e. **Flap**- Whereas a roll consists of several taps, a flap has a single tap. In all other respects, the manner of articulation of the two is the same. The /r/-sound is very often produced as a flap sound.

f. **Lateral**- A lateral is produced when there is only a partial closure at some point in the mouth, so that the air stream can escape on one or both sides of the contact. Since the air can pass continuously, the sound produced is a continuant. /l/ is a lateral consonant.

g. **Fricative**- In this case, there is no closure anywhere; there is only a narrowing. The active articulator comes very close to the passive articulator, leaving only a narrow gap between the two. When the air passes through this narrow gap, it causes audible friction, fricatives are continuants. They are accompanied by audible friction. /f,v,θ,ð,s,z,l,j,3 and h/ are fricative consonants.

h. **Frictionless continuants**- When the active and passive articulators do not come very close to each other and there is sufficient space between them, no audible friction accompanies
the sound produced. [J] is a frictionless continuant.

i. **Semi-vowel**- Semi-vowels are phonetically vowel like since they are produced with a stricture of open approximation and functionally they are consonants as they occupy marginal positions in a syllable /j/ and /w/ are semi vowels.

### 4.3 SECONDARY AND DOUBLE ARTICULATIONS

#### 4.3.1 Secondary Articulations:

Although the description of a vowel segment appears to concentrate attention on the lip posture and on the position of one particular part of the tongue. The terms of place and manner inform about the state of affairs at one particular point in the vocal tract, but what goes on elsewhere is usually ignored, and one does not refer to it when assigning a consonant segment a three term label. Nevertheless, there are occasions when it is necessary to draw attention to aspects of the vocal tract other than place and manner of the stricture and when this is so, one does it in terms of secondary articulations secondary because the stricture referred to by place and manner in the classification of a segment is regarded as its primary articulation.

The primary articulation of a voiced labial nasal, the first segment of the English word *me* for example, is a stricture of
complete closure between the two lips. Behind this primary articulation lies whole of the rest of the vocal tract in which the tongue is free to assume any shape since it is not involved in the primary articulation. The variety of shapes assumed by the tongue in English voiced labial nasals is probably not very great. There is undoubtedly a difference between the \textit{m} of \textit{me} and the \textit{m} of \textit{move} in tongue position, but it is a small one. However, in certain other languages, segments which are also labelled voiced labial nasals are accompanied by more extreme modification of the vocal tract behind the lips by the tongue. In Russian, for example, it is possible to have a voiced labial nasal in which the tongue is raised high in the front of the mouth, in the same position as for a close front vowel. In Egyptian colloquial Arabic, it is possible to have a voiced labial nasal in which the tongue is low in the mouth and retracted towards the back wall of the pharynx. In all these, the secondary articulation is a stricture of open approximation of the articulators, and as such involves less constriction of the vocal tract than the primary articulation does, whatever it may be. The secondary articulation may be either in front of, or behind, the primary articulation. Other terms for the secondary articulations can be coined on these models as the need arises. Often a consonant is produced using two points of articulation, one closure (the 'primary' articulation) being more marked than the other (the 'secondary'
articulation). There are four main kinds of secondary articulation.

a. **Labialisation** - The lips are rounded at the same time as the primary articulation is made, as in the initial consonant of **sue** and **shoe**. A labialized consonant indicated by [w] placed beneath the main symbol, or [ ^= ] placed after it, as in [s_w], [s[^ = ]].

b. **Palatalization** - The tongue is raised to a high front position at the same time as the primary articulation is made. An [i] vowel resonance is added to the consonant, and is symbolized by a small raised [i]. Palatalized consonants are found, for example, in Slavonic languages- as in the contrast between Russian palatalized [tʲ] e.g. [bratʲ] ‘to take’) and non-[palatalized [t] (e.g. [brat] ‘brother’).

c. **Velarization** - The tongue is raised to a high back position at the same time as the primary articulation is made. An [u] vowel resonance is added to the consonant, and is symbolized by the sign [−] through the consonant symbol. A velarized [l] can be heard in English, as in **pool**. A series of velarized sound occurs in Arabic.

d. **Pharyngealization** - The pharynx is narrowed at the same time as the primary articulation is made. An [ə] vowel resonance is added to the consonant and is symbolized by the [−] diacritic - the same as for velarization, but as no language is known to contrast these articulations, there is no ambiguity, Pharyngealized consonants are found, for example, in Arabic.
e. **Nasalization**- The position of the velum forms part of the definitions of stop and of nasal. Nasalization is not, strictly speaking, a secondary articulation, either in the case of vowels or consonants even though it is often, and conveniently, classed among secondary articulations. For example, nasalized sounds are generally represented by [~] placed above the symbol of the normal sound. The best known cases of nasalized sounds are the French vowels [ɛ̃ ɔ̃ O]. Such sounds do not occur in Received English.

4.3.2 **Double Articulation:**

A double articulation is different from a primary articulation accompanied by a secondary articulation, where the latter is subordinate to the form; or a double articulation consists of two structures of equal importance, and in such a case the descriptive label has to contain two terms of place. For example, a voiceless alveolar-velar fricative is found in some dialects of Swedish: it is as if the **ch** of Scottish **loch** and the **sh** of **shall** were said at the same time. Rounded vowels, strictly speaking, are examples of double articulations.

4.4 **ISOLATION**

Isolation refers to the separation of any given segment from its environment in natural speech. Various electronic devices exist by means of which any piece, however small, of a recorded
utterance can be separated from the rest of the utterance, and reproduced by itself. Isolation is feasible with the living and not a recorded voice. To isolate a piece of one's own speech is to hold the speech organs static in a position which is normally rapidly passed through, thus turning a point in the continuum of movements into a sustained posture. With the organs of speech artificially arrested, the posture is available for examination by the senses of touch, sight, and kinesthetic awareness, and if necessary also by instrumental means.

Isolation involves four successive steps, and they are all difficult for the beginner. The first step is to say the word or utterance, from which the segment is to be isolated, in a natural manner. It is an artificial situation, and only after experience does one gain confidence that an approximation to a natural utterance is being produced. The second step is to arrest the continuum of movement at the desired point, and at first this will probably have to be done by successive reductions of what is on either side of this point. The third step is to prolong this point ad libitum, after it is isolated, without changing in any way its quality or posture. The fourth step, which requires a lot of practice with the preceding three, consists of hitting on this artificially isolated posture from memory, without having to refer back first to the utterance from which it was isolated.
When an isolated segment can thus be obtained with confidence, and when it can be said long, loud, and (if voiced) level in pitch, the posture of the organs of speech during its production can be examined and classified according to these principles.

4.5 TAXONOMIC TERMS

Given below is a list of taxonomic terms, or terms of segment classifications with brief definitions:

**Alveolar**- Sound is produced with the teeth-ridge as passive articulator, and either the point or blade of the tongue as active articulator. For example, [t,d,n,s,z,l] sounds in English.

**Alveolar-velar**- Sound is produced when the teeth-ridge and the soft palate are simultaneously passive articulators, and the point or blade of the tongue and the back of the tongue are simultaneously active articulators. For example, it is found in some dialects of Swedish; it is as if the [tʃ] and [ʃ] sounds of Scottish were said at the same time.

**Apical**- Sound is produced when the point of the tongue is active articulator, For example [ʈʂ] sound in Hindi.

**Apico-alveolar**- Sound is produced by the point of the tongue as active articulator and the teeth ridge as passive articulator. For
example, some English speakers use [t,d] sounds as apico-alveolar.

**Apico-dental**- Sound is produced with the point of the tongue as active articulator and the upper front teeth are passive articulator. For example, [t̪,d̪] sounds in Hindi.

**Approximant**- Sound is produced by the central passage of the air-stream and open approximation of the articulators. For example, [w,j] sounds in English.

**Aspiration**- A period of voicelessness after the release of an articulation. For example, “pie” [pʰai] in English.

**Back Vowel**- Sound is produced when the highest point of the tongue lies beneath the soft palate. For example, [u:,u,o,o,a:] are back vowels in English.

**Bilabial**- Sound is produced when the two lips are articulators, for example, [p,b,m] sounds in English.

**Bilateral**- A lateral sound is produced when the air-stream passes round both sides of the central obstruction. For example [l] sound in English.

**Central Vowel**- Sound is produced when the highest point of the tongue lies beneath the junction of hard and soft palates. For example, [ə,ʌ,ɔ:] are central vowels in English.
Close vowel- Sound is produced when the highest point of the tongue is close to the roof of the mouth. For example [i,i:] are close vowels in English.

Clear- Sound is produced along with the tip or blade of the tongue making a firm contact with the teeth-ridge, the front of the tongue is raised in the direction of the hard palate. For example, [l] sound is clear or palatalized when it is followed by a vowel or [j] sound.

Cardinal vowels- A cardinal vowel is a fixed and unchanging reference point, established within the total range of vowel quality, to which any other vowel sound can be directly related. A number of such reference points constitutes a system of cardinal vowel, and any vowel in any language, can be identified by being ‘placed’ within the system. The eight cardinal vowels, therefore, are eight equally spaced auditory points forming a kind of scale of vowel quality. The symbols of the IPA alphabet which have been allotted to the cardinal vowels are as follows: [i,e,ɛ,a,o,ɔ,ʊ].

Dark- Sound is produced along with the tip or blade of the tongue making a firm-contact against the teeth ridge, the back of the tongue is raised in the direction of the soft palate. For example, [l] sound is dark or velarized when it is word-final or followed by a consonant.

Dental- Sound is produced by the upper front teeth as passive
articulator and either the point or blade of the tongue as active articulator. For example, [θ,ð] sounds in English.

**Diphthong**- The vowel at the end does not sound the same as the vowel at the beginning. Such vowels of changing quality are called diphthongs. For example, [ei, ai, ei, au, iø, eø, uø, øu] are diphthongs in English.

**Egressive**- During the articulation of speech-sounds, the airstream moves outwards. For example, the English sounds are egressive.

**Flap**- Sound is produced when the active articulator strikes against the passive articulator just once and then quickly flaps forward. For example, [Y] sound is pronounced as flap by some English people.

**Fricative**- Sounds that are articulated with close approximation of the articulators, and central passage of the air-stream. For example, [f, v, ð, s, z, ñ, h] sounds in English.

**Fricative-lateral**- Sounds that are articulated with close approximation of the articulators, and lateral passage of the airstream. For example, [ll] sound in Welsh.

**Fricative-trill**- Sounds that are articulated with close approximation of the articulators are fricative-trill. For example,
[ɾ] sound in Czech-segments of the type are somewhat uncommon.

**Front vowel**- Sound is produced when the highest point of the tongue lies beneath the hard palate. For example, [i:,i,e,ə] are front vowel in English.

**Glottal**- Sound is produced by the action of the vocal cords. For example [h] sound in English.

**Glottalic**- Sound is produced when an air-stream initiated by the movement of the larynx, with the closed glottis. For example, Sindhi has sounds articulated with glottalic air-stream mechanism. (Those sounds are called implosives).

**Half-close vowel**- Sound is produced when the highest point of the tongue is higher than half way between its positions for a close and open vowels. For example, [ɨ,u] are half-close vowels in English.

**Half-open vowel**- Sound is produced when the highest point of the tongue is lower than half way between its position for a close vowel and its position for an open vowel. For example, [æ,ə] are half-open vowels in English.

**Ingressive**- During the articulation of speech sounds, the air-stream moves inwards. Examples of the sounds produced by an ingressive air-stream are found in languages of the Caucasus, of Africa, the best known of which are Zulu, Hottentot and Bushman
and of central and North America.

**Lamino-alveolar**- Sounds are articulated when the blade of the tongue is active articulator, and the teeth ridge is passive articulator. For example, [t,d] sounds in English are sometimes used as lamino-alveolar.

**Lamino-dental**- Sound is produced when the blade of the tongue is active articulator, and the upper teeth are passive articulator. For example, [t,d] sounds of most French speakers are lamino-dental.

**Labial-alveolar**- Sound is produced when the upper lip and the teeth ridge are simultaneously passive articulators, the lower lip and the point or blade of the tongue are simultaneously active articulators. For example, these stop are rare, but can be found in Nzema, a language of Ghana.

**Labial-velar**- Sound is produced when the upper lip and the soft palate are simultaneously passive articulators, the lower lip and the back of the tongue are simultaneously active articulators. For example, these stop sounds are found in languages of West Africa.

**Labio-dental**- Sound is produced when the lower lip is active articulator, and the upper front teeth are passive articulators. For example, [f,v] sounds in English.
**Lateral**- Sounds that are articulated with a stricture of complete closure in the centre of the vocal tract but with the air escaping along the sides of the tongue without any friction. For example, [l] sound in English.

**Labialized**- Sound is produced with secondary articulation by the rounding of lips just as for a rounded vowel. For example, [ʃ] sound in English is a voiceless palato-alveolar fricative; but as most speakers of English pronounce it as labialized.

**Monophthong**- Vowels that do not change their quality are called monophthongs or pure vowels. For example, [ɪ,ɪː,æ,ɑ,ɔ,ɔ:,u,ʊ,ʌ,ɒ,ʊ,ɔ] sounds are monophthongs in English.

**Nasal**- Sound is produced with complete closure in the mouth and no velic closure, the air-stream escapes through the nose. For example, [m,n,ŋ] sounds in English.

**Nasalized**- Sound is produced with no velic closure, but the air-stream escaping partly through the mouth as well as the nose. For example, [ɛ̃,ʊ̃,œ̃], sounds in French.

**One-tap-trill**- Sound is produced when the active articulator strikes only once against the passive articulator. For example, [ʝ] sound in English and Spanish.

**Open vowel**- Sound is produced when the highest point of the
tongue is as far as possible from the roof of the mouth. For example, [a:] sound in English.

**Palatal**- Sound is produced when the hard palate is passive articulator and the front of the tongue is active articulator. For example, [j] sound in English.

**Palatalized**- Sound is produced with secondary articulation made by raising the front of the tongue towards the hard palate. For example [l] sound in Russian, Gaelic and in English especially in England and in Ireland.

**Palato-alveolar**- Sound is produced when the junction of teethridge and hard palate is passive articulator, and the blade of the tongue is active articulator. For example, [ʃ] sound in English.

**Pharyngeal**- Sound is produced when the back wall of the pharynx is passive articulator, and the root of the tongue is active articulator. For example, [h] sound in Arabic.

**Pharyngealized**- Sound is produced with secondary articulation made by retracting the root of the tongue towards the back wall of the pharynx. For example [l] sound in Arabic and in South England.

**Plosive**- Sound is produced with a stricture of complete closure and sudden release. For example, [p,b,t,d,k,g] sounds in English.
**Pulmonic**- An air-stream initiated by the movement of the respiratory muscles. The walls of the lungs act as the initiator. For example, all English sounds are produced with pulmonic air stream mechanism.

**Retroflex**- Sound is produced when the hard-palate is passive articulator and the tip of the tongue is active articulator. For example, [t,d] sounds in Indian languages.

**Retroflexed**- Sound is produced with secondary articulation made by raising the tip of the tongue towards the hard palate. For example, [ʃ,ʒ,ʃ] sounds in the South-West of England and America.

**Rounded vowel**- Sound is produced with the corner of lips brought forward. For example, [ɔ,ə,u] sounds in English.

**Stop**- Sound is produced by a stricture of complete closure, i.e. oral as well as velic closure. Due to these two closures the air-stream, if egressive, is momentarily completely dammed up, and unable to get through the vocal tract at all. The air is, therefore, compressed behind the point of articulation and escapes with a small explosion when the active articulator is removed from the passive articulator. If the air-stream is ingressive, on the other hand, the air behind the point of articulation is rarefied, and there will be a sudden rush of air inwards, instead of outwards, when the active articulator is removed. In both cases, some sort of a
popping noise, will result. For example, [p, b, t, d, k, g] sounds in English.

 Stops have special names made with different air-streams,

<table>
<thead>
<tr>
<th></th>
<th>ingressive</th>
<th>egressive</th>
</tr>
</thead>
<tbody>
<tr>
<td>pulmonic</td>
<td>-</td>
<td>plosive</td>
</tr>
<tr>
<td>glottalic</td>
<td>implosive</td>
<td>ejective</td>
</tr>
<tr>
<td>velaric</td>
<td>click</td>
<td>-</td>
</tr>
</tbody>
</table>

**Trill-** Sound is produced with a stricture of intermittent closure. For example, [r] sound in Portuguese and occasionally in German and French.

**Unilateral-** A lateral sound is produced when the air-stream escapes round one side only of the central obstruction. For example, [l] sound in Welsh.

**Unrounded vowel-** Sound is produced with the corner of the lips pulled back. For example, [i, i, e, æ] sounds in English.

**Uvular-** Sound is produced when the end of the soft palate with the uvula is passive articulator and the root of the tongue is active articulator. For example, [q] sound in Urdu.

**Velar-** Sound is produced when the soft palate is passive articulator and the back of the tongue is active articulator. For example, [k, g, n] sounds in English.
**Velaric**- An air-stream initiated by the back of the movement of the tongue, when it is in close contact with the soft palate. For example, sounds produced by an ingressive velaric air-stream are found in certain African languages, the best known of which are Zulu, Hottentot and Bushman. These sounds are called 'clicks'.

**Velarized**- Sound is produced with secondary articulation made by raising the back of the tongue towards the soft palate. For example, [l] sound in Russian and Gaelic.

**Voiced**- Sound is produced when the glottis is closed and the vocal cords vibrate when the lung air passes through the closed glottis. Examples: [b,d,g,dʒ,v,ð,z,m,n,ŋ,w,ɾ,j] sounds in English.

**Voiceless**- Sound is produced when the vocal cords are held wide apart and the glottis is open. For example, [p,t,k,tʃ,θ,s,ʃ,h] sounds in English.

**Whispered**- The glottis is narrowed, the vocal cords are brought close together, but not so close that they are set into vibration. The air-stream, however, is impeded by this narrowing as it passes through the glottis, and this cuts down the force of the air-stream and also produces a soft hissing noise. Any segment of an utterance which is produced with narrow glottis is an example of the whispered segment.