UNIT 4 THE CONSONANTS OF ENGLISH

Structure

4.0   OBJECTIVES

In this Unit we shall describe the consonant phonemes of English and the allophones of each phoneme. We shall introduce you to the symbols (given in three dictionaries) for the consonant phonemes of English. These are used to indicate the pronunciation of words. We shall look at sequences of consonants or consonant clusters in the next higher unit i.e. the syllable. We shall also discuss the nature of syllable and the structure of the syllable in English.

After completing this unit you should be able to

(i)   Identify the consonant phonemes of English and phonemic contrasts.
(ii)   Describe the consonant phonemes using the three-term label.
(iii)   Identify the allophones of each consonant phoneme in words and in connected speech.
(iv)   Give the syllable structure of English words.
(v)   Indicate the syllable division in English words.

4.1   INTRODUCTION

In Unit 3, we familiarised ourselves with the difference between the written word and the spoken word. We discussed the lack of correspondence between spelling and

sound in English and the problems it posed for the learning of pronunciation. We saw that the International Phonetic Alphabet was introduced to resolve this problem. We also introduced the terms 'Phoneme' and 'Allophone' in order to understand the difference between phonemic and allophonic transcription. We pointed out the difference between the terms 'phonetics' and 'phonology' and emphasized the importance of both for an understanding of the sounds in the spoken form of a language.

In this unit we shall introduce the symbols used in three dictionaries for the consonants of English. We shall concern ourselves specifically with a detailed description and classification of the consonants of English. Using the descriptive criteria discussed in Unit 2 we shall plot each consonant on the consonant chart. We shall examine the structure of the syllable and the types of syllable in English. We shall also list the possible consonant sequences or clusters in English.

4.2 THE CONSONANT PHONEMES OF ENGLISH

4.2.1 The Choice of A Model

There are 24 consonants in the variety of British English known as *R.P.* or **Received Pronunciation.**

Of the native accents we have chosen R.P. as a model because

(i)   it is a native accent of English which is very widely understood and accepted
(ii)   it is used by most dictionaries to indicate the pronunciation of words
(iii)   there is no pan-Indian accent which can serve as a model or which is being used by lexicographers at present
(iv)   it is an accent that most recognised 'good' speakers in India, (for examples, AIR and Doordarshan newsreaders) tend to approximate to for national and international intelligibility
(v) ·   owing to historical reasons, we have not been exposed to other native accents as much as we have been to the educated southern–eastern British accent. In other words, other native accents such as Educated Scottish, General American, Educated Canadian and Australian have not been easily accessible

4.2.2 The Phonetic Symbols

The Phonetic symbols for the 24 consonants phonemes are given below along with examples to illustrate their occurrence in the initial, medial, and final position. Wherever there is a blank space it indicate that the consonant does not occur in that position. The phonetic symbols used for the consonants are the same as the *Oxford Advanced Learner's Dictionary of Current English* (Revised and updated) by A.S.Hornby, *Longman Dictionary of Contemporary English,* and *English Pronouncing Dictionary* (14th edition) by Daniel Jones

Consonant	Initial	Medial	Final
p	pan	span	sap
b	bit	cubs	nib
t	tip	steel	cut
d	dot	heads	lid
k	kite	skin	lock
g	guide	flags	big
tʃ	chain	touched	catch
dʒ	joy	gauged	edge
m	man	slums	calm
n	nest	sense	stone

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		rings	thing
η		rings	thing
l	lane	spilt	bell
f	fish	raft	stiff
v	veil	sleeves	hive
θ	think	months	width
ð	they	breathed	bathe
s	soap	test	cross
z	zero	confusion	crows
ʃ	shop	brushed	flash
ʒ	-----	confusion	beige
h	heart	behave	-------
r	red	brave	-------
w	watch	sweat	-------
j	yacht	news	-------

4.2.3 Let us now plot these consonants on the chart below:

Table 1 Classification of Consonants

Place	Bila-bial		Labio-dental		Dental		Alveolar		Post Alve-olar		Palato-Alve-olar		Palatal		Velar		Glot-tal	
Manner	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd	vl	vd
Plosive	p	b					t	d							k	g		
Affricate											tʃ	dʒ						
Nasal		m						n										
Fricative			f	v	θ	ð	s	z			ʃ	ʒ					h	
Approximant		w									r			j				
Lateral Approximant								l										

Look at the Table carefully. You will find that when classified according to the manner of articulation there are in English.

     6 plosives
     2 Affricates
     3 nasals
     9 fricatives
     3 Approximants of which /w/ and /j/ are generally called semi-vowels
     1 Lateral Approximant

When classified according to the place of articulation there are in English

     4 Bilabial consonants
     2 Labio-dental consonants
     2 Dental consonants
     6 Alveolar consonants
     1 Post-alveolar consonant
     4 Palato-alveolar consonants
     1 Palatal consonant
     3 Velar consonants
     1 Glottal consonant

Nine of the twenty four consonants are voiceless, the remaining are voiced.

We shall describe the consonants of English in greater detail with reference to that determined by the manner of articulation.

4.3   DETAILED DESCRIPTION OF CONSONANTS

4.3.1   Plosives

There are three stages in the production of a plosive. During the first stage the
articulatory organs come together to make a firm contact with each other. During the
second stage the air from the lungs is compressed behind the closure. During the third
stage the air is released with explosion owing to the sudden parting of the articulatory
organs.
English (RP) has six plosives
Bilabial /p,b/
Alveolar /t,d/
Velar /k, g/

/p,t,k/ are voiceless and /b,d,g/ are voiced.

Bilabial Plosives /p,b/

For the production of /p/ the two lips are tightly closed, the lung air is compressed
behind the closure, the vocal cords are kept wide apart. The soft palate is raised to
shut off the nasal cavity when the closure is released, the compressed air escapes with
force. Thus /p/ is a *voiceless bilabial plosive.*

Allophones of /p/

(a) /p/ is *aspirated* [p^h] when it occurs initially and in an accented syllable. For
 example, pool, part, ap'pear, play, ap'point, pure.

In all such cases the vowel or voiced consonant that immediately follows /p/ becomes
devoiced.

(b) /p/ is unaspirated when
   (i)   it occurs in unaccented syllables as in *pre'vent, 'leper, 'temper*
   (ii)   it is preceded by /s/ as in *spell, spy, speech,* and
   (iii)   it occurs medially in a syllable as in *opt, kept, lapse*

(c) /p/ is inaudibly released or released without explosion when
   (i)   it occurs finally, that is before silence, as in *cap, step, sweep*
   (ii)   it occurs before another plosive or affricate for example, *kept, wrapped,
            keep checking*

(d) /p/ is nasally released i.e., the air passes out through the nasal passage when it is
 followed by /n/ as in *topmost, stop me.*

   /b/

The consonant /b/ differs from /p/ only in respect of voicing i.e. in the production of
/b/ the vocal cords vibrate. Hence it is a *voiced bilabial plosive*

Allophones of /b/

(a) /b/ is devoiced in the initial and final positions in words because the voicing of
 /b/ is delayed owing to the silence that precedes it in the initial position for
 example *belt, bird, broad.* It is devoiced in the final position in words because of
 the silence that follows for example *job, robe, tub.*

(b) /b/ is unexploded or inaudibly released (i) in the final position in words for example *crib, sob.* (ii) when it occurs before another plosive or affricate for example, *snubbed, obtrude, subdued, object*

(c) /b/ is fully voiced when it occurs between two vowel sounds which are voiced for example *rubber, suburb, above, subaltern*

(d) /b/ is nasally released i.e. the air is released through the nose when it is followed by /m/ as in *submarine, submerge*

Alveolar Plosives /t,d/

For the articulation of /t/ and /d/ the tip and blade of the tongue makes a firm contact with the alveolar ridge, the lung air is compressed behind the closure and the velum is raised to shut off the nasal passage. With the release of the closure, the compressed air escapes with explosion.

For /t/ the vocal cords are apart, therefore it is voiceless. For /d/ the vocal cords vibrate, therefore it is voiced.

Allophones of /t/

(a) Like /p/, /t/ is aspirated when it occurs in the initial accented position in words. For example *torch, at'tain, twist, trailor.* In all such cases the voiced consonant or vowel that immediately follows /t/ becomes devoiced. For example /w/ in *twist* and /r/ in *trailor* are devoiced.

(b) /t/ is unaspirated (like /p/), when
   (i) it occurs in unaccented syllables. e.g. *'litter, to'night, 'satire*
   (ii) it is preceded by /s/, eg *steam, strap, stew*

(c) it is inaudibly released in the final position in words, i.e. before silence, e.g. *date, bought* and when it is followed by another plosive or affricate e.g. *wet day, white dress, dustbin, hot chips, white chalk.*

(d) it is nasally released i.e. the air passes out through the nose, if it is followed by /n/, e.g. *cotton, rotten, button*

(e) it is laterally released when it is followed by /l/, e.g. *kettle, bottle, rattle*

(f) /t/ becomes a dental plosive (like the Hindi त as in तौल 'weigh') if it is followed by the dental fricatives / θ, ð /, e.g. *eighth, eat these.*

(g) it is realized as a post-alveolar plosive when followed by the post-alveolar approximant /r/, e.g. *tree, portray, trim*

Allophones of /d/

(a) /d/ is devoiced when it occurs initially in a word e.g. *dip, day, dread, due* and finally e.g. *flowed, read, hide*

(f) it is inaudibly released when
   (i) it occurs finally e.g. *asked, told*
   (ii) it is followed by another plosive or affricate, e.g. *good times, wide gap, lead pencil, bad judge*

(g) /d/ is fully voiced, that is voiced through all the three stages of its articulation, when it occurs between voiced sounds e.g. *radar, modest, goodwill*

(h) /d/ is nasally released when it is followed by /n/ *hidden, midnight, goodness, loud noise*

(i) /d/ is laterally released when followd by /l/, e.g. *fiddle, red light, bed lamp*

(j) /d/ becomes a dental plosive (like Hindi द in दिल 'heart') when it is followed by the dental fricatives / θ, ð /, e.g. *width, sad thought, feed them.*

(k) /d/ is realised as a post-alveolar plosive when it is followed by the post-alveolar approximant /r/ as in *drop, fried rice*

Pronunciation of the past tense marker –d or –ed

The past tense marker –d or –ed is pronounced

(i)   /t/ after voiceless consonants other than /t/ for example

/ræpt/	*wrapped*	/si:st/	*ceased*
/beɪkt/	*baked*	/flæʃt/	*flashed*
/stʌft/	*stuffed*	/sɜ:ʃt/	*searched*

(ii)   it is pronounced /d/ after voiced sounds (voiced consonants and vowels) other than /d/

/rɒbd/	*robbed*	/kraɪd/	*cried*
/begd/	*begged*	/ʃəud/	*showed*
/lʌvd/	*loved*	/bru:d/	*brewed*

(iii)   it is pronounced /ɪd/ after /t,d/ e.g. *rated, plotted, moulded, glided*

Velar Plosives /k,g/

For the production of /k/ and /g/ the back of the tongue makes a firm contact with the soft palate or velum, which is raised to shut off the nasal passage. The lung air is compressed behind the closure. The closure is released and the compressed air escapes with plosion. For /k/ the vocal cords are wide apart, therefore it is a *voiceless velar plosive*. For the production of /g/ the vocal cords vibrate. Thus it is a *voiced velar plosive*.

Allophones of /k/

(a) Like /p and t/, /k/ is aspirated when it occurs in the initial accented position in words. e.g. *court, kite, ac'cord, quarter, crane*. In all such cases, the vowel or voiced consonant that immediately follows /k/ becomes *devoiced*.
(b) /k/ is unaspirated when
   (i) it is preceded by /s/, e.g. *score, skates, skiing, squash*
   (ii) it occurs in unaccented syllables, e.g. *'basket, con'trast, 'rocket*
(c) /k/ is inaudibly released, that is, without plosion, when
   (i) it occurs finally in words, i.e., before silence, e.g. *lock, wreck, make*
   (ii) it is followed by another plosive or affricate e.g. *locked, black beard, rock garden, thick chain.*
(d) /k/ is articulated nearer the hard palate when followed by a front vowel e.g. *keep, kid, cap*. It is an advanced variety of /k/.
(e) /k/ is articulated further back in the month when followed by a back vowel, e.g. *cast, cost, cord. cook*

Allophones of /g/

(a) /g/ is fully voiced, when it occurs between two vowels, e.g. *luggage, regal, forgo*
(b) /g/ is devoiced when it occurs initially in a word because it preceded by silence. E.g. *goal, guide, gear*.
   It is devoiced when it occurs finally in words because it is followed by silence e.g. *log, mug, flag*
(c) /g/ is inaudibly released when
   (i) it occurs finally, e.g. *big, stag, jug*
   (ii) it is followed by another plosive or affricate e.g., *big dog, stag party, egg cup, fig tree, big jar.*
(d) /g/ is articulated nearer the hard palate, i.e. it is advanced when followed by a front vowel, e.g. *give, get, gain*.
   It is articulated further back in the mouth i.e. at the soft palate, when followed by a back vowel, e.g. *guard, gollywog, gorgeous, goose*.

4.3.2 Affricates

Palato-alveolar Affricates /tʃ and dʒ/

During the articulation of /tʃ and dʒ/, the tip and blade of the tongue makes a closure with the alveolar ridge, the rims of the tongue make a contact with the upper side teeth. At the same time, the front of the tongue is also raised towards the hard palate. The soft palate is raised to shut off the nasal passage. The closure is released slowly, the air escaping with friction occurring between the blade-to-front region of the tongue and the alveolar-to-front palatal section of the roof of the mouth.

During the stop and fricative stages the vocal cords are wide apart for /tʃ/, thus it is voiceless. They vibrate for /dʒ/, which is voiced. The lip position will be conditioned by that of adjacent sound. (e.g. lip rounding is greater in *choose* in relation to that of *cheese*.), though with some speakers a certain amount of lip-protrusion is always present for these two consonants.

Allophones of /tʃ/

No important variants of /tʃ/ occur, except for the degree of rounding and protrusion which depends on the vowel following /tʃ/.

Allophones of /dʒ/

(a) /dʒ/ is devoiced when it occurs initially in a word, e.g. *joke, giraffe, jewel,* and when it occurs word finally, e.g. *badge, siege, rage.*
(b) /dʒ/ is fully voiced, that is, it is voiced through all the stages of its articulation, when it occurs between voiced sounds e.g. *ledger, rejoice, suggest.*

4.3.3 Nasals /m,n,ŋ/

Nasals are produced by making a complete closure in the mouth (as for plosives). They are different from plosives in that the soft palate is lowered and the air allowed to pass through the nasal passage. Since the air escapes through the nose, nasals can be continued, whereas plosives cannot. In this respect they are like fricatives, though there is no audible friction as there is in the case of fricatives. They are, in other words, vowel-like. *All the three nasals in English are voiced.*

Bilabial Nasal /m/

For the articulation of /m/ we make a complete closure at the lips. The soft palate is lowered to allow a free passage of air through the nose.

Allophones of /m/

(a) /m/ is realised as a labio-dental nasal [ɱ] when it is followed by the labio-dental fricatives /f,v/ e.g. *comfort, triumph, circumvent, some vibration.*
(b) /m/ is devoiced when preceded by /s/, e.g. *smooth, smoother, smug, course materials.*

Alveolar nasal /n/

For the production of /n/ we make a closure in the mouth between the tip of the tongue and the alveolar ridge, and the rims of the tongue and the upper side teeth. The soft palate is lowered and the air passes out through the nose without any obstruction.

Allophones of /n/

(a) when /n/ is followed by /θ, ð/ in words, it is released as a dental nasal as in *ninth, plinth, fine them, sign these.*

(b) /n/ becomes a post alveolar nasal when followed by /r/ e.g. *unrest, enrapt, run-rate*

Velar nasal /ŋ/

To articulate /ŋ/ we make a complete closure between the back of the tongue and the soft palate. The soft palate is lowered to allow the air to pass freely through the nose.

/ŋ/ is regularly represented by the spelling *ng* or *n* followed by a letter representing /k/, e.g. *ring, lung, drink, wrinkle, anchor*.

The spelling *ng* in the final position in words is always pronounced /ŋ/, never /ŋg/, e.g. *long, bring, string*.

The spelling *ng* in the medial position in words is, however pronounced

(iii)   /ŋ/ in derivatives of verbs ending in /ŋ/, e.g. *bringing, longing, singer*.
(iv)   /ŋg/ in other words, e.g. *longer* (comparative degree of the adjective *long) finger*,
         hunger

There are no allophonic variants of /ŋ/.

4.3.4   Fricatives

For the articulation of fricatives there is no closure in the oral tract as there is in the case of plosives, affricates and nasals. The articulators are brought sufficiently close to each other so that the air produces audible friction in passing through the narrow gap between them.

Labio-dental fricatives /f, v/

During the production of /f,v/, the soft palate is raised shutting off the nasal passage of air. The lower lip makes a light contact with the front upper teeth, leaving a narrow gap through which the lung air escapes, producing audible friction. The vocal cords are held wide apart for /f/ which is voiceless. The vocal cords vibrate for /v/ which is voiced.

Allophones of /f/

/f/ has no important allophones.

Allophones of /v/

(a) /v/ is devoiced when it occurs initially (i.e. after silence) e.g. *voice, vowel, vain*
(b) /v/ is devoiced when it occurs finally (i.e. before silence), e.g. *drive, value, save*.

Dental fricatives /θ, ð/

For the production of /θ, ð/ the soft palate is raised to shut off the nasal passage of air, the tip of the tongue makes a light contact with the inner surface of the upper front teeth, the rims of the tongue make a firm contact with the upper side teeth. The lung air escapes through the narrow gap between the tip of the tongue and the upper front teeth, causing audible friction. For /θ/ the vocal cords are apart. It is thus a voiceless consonant. The vocal cords vibrate for / ð /. Therefore it is voiced.

Allophones of /θ/

There are no important allophonic variants of /θ/.

Allophones of / ð /

(a) / ð / is devoiced when it occurs initially (i.e. after silence), e.g. *these, therefore, theirs*.

(b) / ð / is devoiced when it occurs finally (i.e. before silence), e.g. *seethe, breathe, soothe*

Alveolar fricatives /s, z/

For the articulation of /s,z/ the soft-palate is raised to shut off the nasal passage of air, the tip and blade of the tongue make a light contact with the teeth ridge. At the same time the side rims of the tongue make a firm escape through a narrow groove along the centre of the tongue, causing audible friction between the tongue and the teeth ridge. The vocal cords are wide apart for /s/, therefore, it is voiceless. For /z/ the vocal cords vibrate, therefore it is voiced.

Allophones of /s/

There are no allophonic variants of /s/.

Allophones of /z/

(a) /z/ is devoiced when it occurs initially (i.e. after silence) e.g. *zoo, zero, xerox*.

(b) /z/ is devoiced when it occurs finally (i.e. before silence), e.g. *rose, breeze, choose*

The pronunciation of the suffixes *(e) s, 's, s'*.

The suffix *–s and –es* used in the plural formation of nouns or the third person singular present tense form of verbs, and the suffix *'s or s'* for the possessive forms of nouns are pronounced in three different ways, depending upon the ending of the stem (i.e. the uninflected form of the noun or verb).

(i) /ɪz/ after /s, z, ʃ, ʒ, tʃ, dʒ/, e.g.

faces	passes	princess's
roses	loses	Collins's
brushes	crashes	coaches
mirages	massages	coaches'
churches	stretches	judge's
judges	singes	judges'

(ii) /z/ after a voiced sound (i.e. all vowels and voiced consonants) other than /z, ʒ, dʒ/

days	plays	baby's
flags	bribes	chilldren's
birds	slogs	teacher's
hives	dives	teachers'
buns	burns	colonel's
films	swims	colonels'
bales	sells	adam's

(iii) /s/ after a voiceless consonant other than /s, ʃ, tʃ/:

bats	fits	elephant's
caps	wraps	ship's
hooks	bakes	bullock's

| putfs | bluffs | calf's |
| baths | froths | Ruth's |

Palato-alveolar fricatives /ʃ, ʒ/

For the production of /ʃ, ʒ/ the soft palate is raised to shut off the nasal passage of air. The tip and blade of the tongue make a light contact with the alveolar ridge and the side rims of the tongue make a firm contact with the upper side teeth. At the same time the front of the tongue is also raised towards the hard palate. As a result of this simultaneous raising of the front of the tongue, the narrowing between the tongue and the roof of the mouth spreads from the tip and blade to the front of the tongue. The air escapes through this narrow but diffuse gap with audible friction. The vocal cords are wide apart for /ʃ/ which is voiceless. For /ʒ/ the vocal cords vibrate. Therefore it is voiced.

Some native speakers produce these two consonants with rounded lips in all positions in words; others do so only when a rounded vowel (e.g. ɒ, ɔː, ʊ, uː) precedes or follows them.

Allophones of /ʃ/

There are no allophonic variants of /ʃ/

Allophones of /ʒ/

(a) /ʒ/ may be devoiced when it occurs in the final position in words, e.g. *prestige, beige, massage.*

Glottal Fricative /h/

For the production of /h/, the soft palate is raised. The air from the lungs escapes through a narrow glottis with audible friction. The position of the tongue and lips is determined by the following vowel. Thus for the articulation of /h/ in *heat*, the front of the tongue is raised towards the hard palate and the lips are spread. For the articulation of /h/ in *hoof*, the back of the tongue is raised to the soft palate and the lips are rounded. All such types of English /h/ have one feature in common, that is, the passage of a strong, voiceless airstream through the open glottis. /h/ is therefore referred to as a *voiceless glottal fricative*

Allophones of /h/

(a) Between two voiced sounds, /h/ is realised as a voiced glottal fricative, e.g. *behold, behave, behest.*

4.3.5 Lateral Approximant

A lateral consonant is produced when there is a closure, essentially, in the centre of the oral passage, so that the air can escape on one or both sides of the closure. English has only one lateral, the alveolar lateral /l/.

Alveolar lateral Approximant /l/

During the articulation of /l/ the tip of the tongue is in contact with the alveolar ridge, with one or both sides of the tongue remaining low so that the lung air can escape freely without friction through the side(s). The soft palate is raised to shut off the nasal passage of air, and the vocal cords vibrate. /l/ is thus a *voiced alveolar lateral approximant.*

Allophones of / l /

The two main allophones of / l / are the Clear [l] and the Dark [ɫ]. In addition to the description given above, for clear [l], the front of the tongue is raised towards the hard palate, while, for dark [ɫ], the back of the tongue is raised towards the soft palate, the front of the tongue being somewhat depressed.

(a) Clear [l] is used only when the lateral approximant is followed by a vowel or a semi-vowel, e.g. *large, lake, lose, flute, lieu, lure.*

(b) Dark [ɫ] is used whenever the lateral is not followed by a vowel, e.g. word finally as in *feel, spoil, tall,* and before consonants other than /j/, e.g. *wealth, realm, bulk, fault, cooled, solve, elbow.*

(c) / l / becomes devoiced when it is preceded by aspirated /p^h,k^h/ e.g. *please, clear, reply.* / l / is less devoiced when it is preceded by unaspirated /p,k/ or by /s,f, ʃ, θ/, e.g. *stapler, sprinkles, mostly, antler, slow, fleet, breathless, pamphlet*

Approximants /r,j,w/

Post-alveolar Approximant or frictionless continant /r/

For the articulation of /r/, the tip of the tongue moves towards the alveolar ridge, so that the gap between the tongue and the roof of the mouth is wide enough for the lung air to pass through freely without any audible friction. The soft palate is raised to shut off the nasal passage of air. The vocal cords vibrate, /r/ is therefore voiced.

Pronunciation of the letter r

In R.P., the letter *r* is pronounced only when it occurs immediately before vowels. It is silent before consonants and word finally; for example in the words *aroma character, around* the *r* is pronounced, while in words *yard, start, blurred* the *r* in the spelling is not pronounced and in the words *far, fair, mother* the *r* in the final position is not pronounced either. Similarly when words with *r* in the final position are followed by a word beginning with a consonant, the *r* is not pronounced e.g. *a far cry, a fair game, mother called.* But they are pronounced with /r/ if they are followed by another word beginning with a vowel, where /r/ has a linking form. e.g. *A far off place, fair enough, mother and father.*

However in other native varieties of English; such as Standard American English, Educated Scottish English, the *r* in the spelling is pronounced in **all cases.**

Allophones of /r/

(a) /r/ is realised as a voiced post-alveolar fricative [ɹ̠] when it is preceded by /d/, e.g. drill, drive, dread, quadrangle

(b) /r/ is realised as a devoiced post-alveolar fricative [ɹ̠̊] when it is preceded by the voiceless aspirated plosives /p, /t/, or /k/, e.g. *'pretty, ap'prove, 'tractor, por'tray, 'crowded, de'crease.*

(c) /r/ becomes a slightly devoiced post-alveolar fricative when it is preceded by voiceless consonants other than the aspirated /p,t,k/. e.g. *fret, shrink, saffron, mushroom,* and when it is preceded by unaccented /p,t,k/ e.g. *'upright, 'April, spray, nitrate, strict, 'cockroach, 'acrobat.*

(d) /r/ is frequently revealed as a voiced alveolar tap or flap when it occurs between two vowels, e.g. *terrible, carry, sorry, forever* and when it is preceded by / θ / or / ð /, e.g. *thrifty, thrice, forthright, with regards.*

There are thus a number of allophones of the /r/ phoneme described above, i.e. voiced post-alveolar frictionless continuant [ɹ]. Nevertheless, the variety of /r/ described i.e. post alveolar approximant still remains the most frequent variety in R.P. because the contexts in which it occurs are most frequent. These are

(i)   Initially before vowels, e.g. *ride, ring, road, rude*
(ii)   After voiced consonants other than /d/, e.g. *bread, grow, still raw, all right.*
(iii) In the word-final position when followed by another word beginning with a vowel, e.g. *answer it, wear out, take care of, far and near*

Approximants (Semi-Vowels)

Semi-vowels are rapid vowel glides within the same syllable. They are vowel-like in that there is a free passage of air because the articulators are fairly far apart. But they are treated as consonants because they function as consonants. This is borne out by the fact that we use *a* not *an* before words beginning with /j or w/, e.g. *a unit, a yak, a yesman, a wheel, a watch, a wasp.* Before vowels *an* is used, e.g. *an hour, an honest person, an apple.* Semi-vowels, like the vowels in English, are voiced.

Labio-velar Semi-vowel /w/

For the production of /w/ the back of the tongue moves towards the soft palate, and then moves quickly to the position of the following sound. The lips are rounded, the vocal cords vibrate.

Allophones of /w/

(a) /w/ is devoiced after aspirated /t/,/k/, e.g. *twist, tweed, queen, quick.* It is also slightly devoiced after unaspirated /p/ /t/ /k/ and other voiceless consonants e.g. *at work, squash, swim, squirrel, thwart, swear, upward, outward, equal.*

Palatal Semi-vowel /j/

For the production of /j/ the front of the tongue is raised towards the hard palate but is not so close as to cause audible friction. In other words, the lung air can pass out freely without any audible friction. The tongue moves away immediately to the position of the following sound. The soft-palate is raised to shut off the nasal passage, and the vocal cords vibrate. /j/ is thus a *voiced palatal semi-vowel.*

Allophones of /j/

(a) /j/ is realised as a voiceless palatal fricative when it is preceded by aspirated /p,t,k/ and /h/, and followed by /u:, uə/, e.g. *puny, puritan, tune, cube, human, cure.*
(b) /j/ is devoiced when it is preceded by unaspirated /p,t,k/ as in 'student, 'copula, 'occupy.

4.4   CONSONANT CLUSTERS IN ENGLISH

4.4.1   Introduction

We have studied in detail the consonant phonemes of English. We shall now look at the possible ways in which consonants can combine with one another in words. There are certain restrictions on the combinatorial possibilities.

(i)   In the initial position /tʃ, dʒ, ð , z/ do not combine with any consonant
(ii)   /r, j, w/ can occur only as the final element in initial clusters, e.g. /tr, dr, kr, br, fr, pr, gr, sr, tj, dj, kj, fj, pj, tw, dw, kw, sw/
(iii) In the final position, consonant clusters such as /pf, td, lzd, zbd/ are not possible.

When we refer to sequences of consonants that occur within a syllable we generally call them consonant clusters. Since we have to refer to the syllable in order to define a consonant cluster, it would be worthwhile explaining what a syllable is.

4.5   THE SYLLABLE

The phonemes of a language combine to form the next higher unit, which in turn forms part of the next higher unit, and so on.

The unit at the next higher level than the phoneme is called the syllable. The syllable as a unit distinct from the phoneme and the word is very significant in the production of speech, and we cannot describe and analyse speech without taking it into account.

Though many attempts have been made to define the term 'syllable', no agreed definition is yet available. However, it is not so difficult to identify the number of syllables in a given word. And this is sufficient for us to be able to divide words into syllables.

4.5.1   Division of words into syllables

A word can consist of one or more than one syllable. It should be comparatively easy to point out how many syllables a given word has in most cases. For example, it is not difficult to say that the words *rock, reply, hesitate, introduction, electricity, characterization,* have one, two, three, four, five and six syllables, respectively. How can we count the number of syllables in a word? The simplest procedure would be to count the number of vowel sounds in a word. **Thus there would be as many syllables in a word as there are vowels.** The word *rock* has only one vowel sound, the word *reply* has two vowel sounds and so on. This becomes clearer if we transcribe these words to get their pronunciation - /rɒk/, /rɪplaɪ/, /hezɪteɪt/, /ɪntrədʌkʃn/, Ilektrɪsɪtɪ/, /kærɪktəraɪzeɪʃən/. Now if we mark the syllable division with a hyphen we get the number of syllables in each word thus - /rɒ k/ /rɪ-plaɪ/, /he-zɪ-teɪt/, in-trə-dʌk-ʃən/, /ɪ-lek-trɪ-sɪ-tɪ/, /kæ-rɪk-tə-raɪ-zeɪ-ʃen/ (we thus must remember that the diagraph – i.e., a sequence of two letters, such as /aɪ, eɪ/ represent only one vowel sound).

However, we may sometimes find it difficult to decide where to draw the syllable boundary. For, while we would seldom disagree on the number of syllables of a word we might differ regarding the placement of the syllable boundaries in a word.

There are two kinds of problems that make it difficult for us to decide where to draw the syllable boundary. The first problem is that is spelling. Words with double letters in the spelling and words with the letter *x* in the spelling. The syllable boundary is to be marked with a hyphen **between** the double letters in words where the double letters occurs for example, *ac-cept, af-ford, ac-com-mo-date, al-lo-cate, com-mute, as-sume.*

In the case of words with the letter we are faced with just the reverse of the problem, we face when dividing words with double letters into syllables. *x* stands for two sounds. For instance, in the words *exercise, exact,* and *luxury,* the letter *x* represents the sounds /ks, gz, kʃ/ respectively. If we go by the spelling it will be difficult to decide whether to divide these words as *ex-er-cise, ex-act* and *lux-u-ry,* or *e-xer-cise, e-xact,* and *lu-xu-ry.* When we transcribe all these words we find that syllable division is easy. /ək-sept/, /ə-ʃɔ:d/, /ə-kɒ-mə-deɪt/, / æ-lə -keɪt/, /kə-mju:t/ /ə-sju:m/ /ek-sə-saɪz/ /eg-zækt/ /lʌk-ʃə-rɪ/

It would therefore be advisable to transcribe such words before we can divide them into syllables.

There is yet another difficulty we are likely to face while deciding where to mark syllable boundaries in a word. For example, let us take up the words, *astride*, /əstraɪd/, *excuse* /ɪkskju:s/, and *extra* /ekstrə/. There are two or more ways of syllabying these words. The question is, which one of these two, or three alternatives should we choose. Two possible ways of marking syllable division would be - /ə-straɪd/ or /əs-traɪd/. There is no fixed rule regarding the choice of alternative divisions apart from the constraint that the division should not violate any rules of the phonology of the language. Thus both the divisions are possible.

Thus while dividing words containing two or more consonants into their constituent syllables, we need to ensure that the rules of English phonology regarding the occurrence of these clusters are not violated.

To understand this better we will now study in detail the structure of the syllable and the possible initial and final consonant clusters in English.

4.5.2   The structure of the syllable

As we have said earlier the syllable is the next higher unit, that is made up of one or more than one speech sound. The vowel element is so essential to the structure of a syllable that we cannot have a syllable without a vowel element. We count the number of syllables in a word on the basis of the number of vowel sounds in the syllable. The vowel element being obligatory in a syllable, therefore if we have a syllable of only one sound, the sound will be a vowel, for example /aɪ/, *a* /ə/, *eye* /aɪ/, *air* /eʊ/. *The vowel is therefore known as the nucleas of the syllable*. The consonants on the other hand occupy the marginal place in a syllable. The consonants which begins a syllable is called the releasing consonant. For example, in the words *do, raw, see* the consonants /d, v and s/ are **releasing consonants**. The consonant that ends a syllable is known as the **arresting consonant**. In the words *boat, nose, get, bid*, for instance, the releasing consonants are /b, ng, l/ and the arresting consonants are /t,z,t,d/. Now if we represent the obligatory element by the letter V and the marginal element by the letter C, the syllable *seed* can be represented as CVC. However, it is not always the case that a consonant occupies only the marginal position in a syllable. There are syllables in which the nuclear place is occupied by certain consonants. Let us take the words *cotton* /kɒtn/, *battle*, /bætl/, and *rhythm* /rɪðm/. It is generally agreed that these words have two syllables each and not one. Thus the syllable division of these words would be /kɒ-tn/, /bæ-tl / and /rɪ-ðm/. The second syllable in each word apparently has no vowel only the consonants / -tn/, / -tl/, with no vowel between them. In such cases, the sounds /n, l and m/ perform the function of the V element or the nucleus of the syllable and are called **syllabic consonants**. This is possible because /n,l and m/ are all phonetically vowel-like. When /n/, /l/ and /m/ function as syllabic consonants, they are generally marked in a narrow transcription, with the diacritic [ˌ] [as in [sʌdn̩]; [bɒtl̩].

4.5.3   Types of the Syllable

Using the symbols <u>V</u> and <u>C</u> to represent the obligatory and marginal elements in the syllable. The different types of syllables possible in English are as follows:

	Syllable Type		Example
(a)	V	-	eye, a, I, ear
(b)	VC	-	eat, ache, all
(c)	CV	-	hay, saw, tea
(d)	CVC	-	bun, pit, miss
(e)	CCV	-	stay, sky, play, cry, small

(f)	CCCV	-	stray, spree, straw, screw
(g)	CCCVC	-	stream, screech, stroll, spring, spread, squad
(h)	CCCVCC	-	screeched, strained, sprawled, sprint, squeaked
(i)	CCCVCCC	-	strands, strengths, splints, scrounged,
(j)	VCC	-	apt, aunt, east, elf, ached,
(k)	CVCC	-	tax, bent, watched, chance, wrench
(l)	CVCCC	-	lapsed, next, text, danced
(m)	CCVCC	-	stamp, frank, crest, quaint, pruned, frisk.
(n)	CCVCCC	-	twelfth, prompt, stamped, stunts,
(o)	CCVCCCC	-	twelfths, prompts, glimpsed
(p)	CVCCCC	-	texts, tempts

From the syllable types we have listed above we have seen that English permits upto three consonants at the beginning of a syllable and upto four at the end of a syllable. These types can be represented like this – C_0-C_3 V C_0-C_4 Such sequences of consonants are called <u>initial</u> and <u>final</u> consonant clusters respectively. For example, /-nd/ in the word <u>mend</u> is a consonant cluster because it forms part of the same syllable, whereas /-mb/ in the word <u>member</u> /mem-b ɘ/ is not a cluster since /m/ and /b/ belong to two different syllables: /-m/ is the <u>arresting</u> consonant of the first syllable, and /b-/ the <u>releasing</u> consonant of the second. Consonants like /-m/ and /b-/ which occur together in a word but form part of two different syllables, are called <u>abutting</u> consonants.

4.6   INITIAL AND FINAL CONSONANT CLUSTERS

Having studied the syllable in detail and the cluster types that are permitted in English, let us list the combinations of consonants that are possible in 2, 3 or 4 consonant clusters in the initial and the final position in a syllable.

4.6.1   Initial two-consonant clusters

(a)   Two-consonant clusters with /s/ as the first consonant.

St   p   t   k   b   d   g   f   θ   s   ʃ   h   v   z   ʒ   m   n   y

Spot stick skin   -   -   - sphere-   -   -   -   -   -   - smoke snail

(b)   Two consonant clusters with / l ,v, w, j/ as the second consonants.

	p	t	k	b	d	g	f	O	s	ʃ	h	v	m	n	l
l	plum	-	clown	blow	-	glow	flag	-	slow	-	-	-	-	-	-
r	pray	tray	crow	brown	dre-am	grass	fry	throw	-	Shr-ine	-	-	-	-	-
w	-	twin	quick	-	dwe-ll	?*	-	thwart	swe-ep	-	-	-	-	-	-
j	puny	tune	queue	beauty	dew	?*	feud	-	suic-ide	-	hue	view	mu-sic	news	lure

4.6.2   Initial three-consonant clusters

When three consonants form an initial cluster in English, the first consonant is invariably /s/, the second one of the three voiceless plosives /p,t,k/ and the last one of these/ l ,v,w,j/

Thus the possible clusters are:-

Example

/spl-/	spleen, splutter, splint, splice
/spr-/	sprint, sprain, sprout, spruce
/spj-/	spurious
/str-/	stress, strive, strange
/stj-/	stew, student, stupid
/skl/	sclerosis
/skr-/	screech, script, screen
/skw-/	squad, squat, squint, squeeze

4.6.3 Final two-consonant clusters

Example

/p/	as the first consonant	/-pt./	stopped, wept
		/-pө/	depth
		/-ps/	lapse, tops
/t/	as the first consonant	/-tθ/	eighth
		/-ts/	mats, huts
/k/	as the first consonant	/-kt/	act, sect
		/-ks/	books, fox
/b/	as the first consonant	/-bd./	sobbed, rubbed
		/-bz/	robes, cubs
/d/	as the first consonant	/-dz/	seeds, birds
/g/	as the first consonant	/-gd/	dragged, plugged
		/-gz/	flags, slugs
/tʃ/	as the first consonant	/-tʃt/	patched, watched
/dʒ/	as the first consonant	/-dʒd/	smudged, judged
/f/	as the first consonant	/-ft/	theft, coughed,
		/-fθ/	fifth
		/-fs/	sniffs, bluffs
/θ/	as the first consonant	/-θt/	breathed/breθt/ (a phonetic term)
		/-θs/	myths, heaths
/s/	as the first consonant	/-sp/	wasp, lisp
		/-st/	fast, host
		/-sk/	ask, risk
/ʃ/	as the first consonant	/-ʃt/	crashed, pushed
/v/	as the first consonant	/-vd/	solved, saved
		/-vz/	thieves, caves
/ð/	as the first consonant	/-ðd/	writhed, breathed
		/-ðz/	paths, wreaths

/z/ as the first consonant	/-zd/	(sur)prised, (ad)vised
/ʒ/ as the first consonant	/-ʒd/	rouged
/m/ as the first consonant	/-mp/	cramp, lamp
	/-md/	combed, summed
	/-mf/	nymph
	/-mθ/	warmth
	/mz/	sums, limbs
/n/ as the first consonant	/-nt/	slant, scent
	/-ntʃ/	lunch, wrench
	/ndʒ/	hinge, range
	/-nθ/	ninth, plinth
	/-ns/	dance, fence
	/-nz/	fins, buns
/ŋ/ is the first consonant	/-ŋt/	tank, brink
	/-ŋd/	hanged, wronged
	/-ŋz/	longs, brings
/l/ as the first consonant	/-lp/	pulp, help
	/-lt/	belt, quilt
	/-lk/	bulk, milk
	/-lb/	bulb
	/-ld/	bold, curled
	/-ldʃ/	belch, milch
	/-ldʒ/	bulge, (di)vulge
	/-lm/	film
	/-ln/	kiln
	/-lf/	elf, shelf
	/-lv/	valve, shelve
	/-lθ/	health, wealth
	/-ls/	false, else
	/-lz/	fills, kills

Final three-consonant clusters (-CCC)

In all the consonant clusters listed below, /s/ is the last consonant, which usually represents the suffixes –(e)s, -'s, and –s':

Consonant Cluster	Example(s)
/-pts/	(a)dopts
/-pθs/	depths
/-tθs/	eights
/-kts/	facts
/-mps/	pumps
/-mfs/	nymphs, nymph's
/-nts/	ants
/-nθs/	tenths, plinths
/-nks/	links, thinks, sinks
/-lps/	helps
/-lts	colts
/-lks/	hulks, silks
/-lfs/	gulfs
/-lθs/	healths
/-fts/	lifts

/-fθs/	fifths
/-sps/	wasps. grasps
/-sts/	toasts
/-sks/	asks

/z/ is the final consonant in the clusters listed below: it usually represents the suffixes
–(e) s, -'s, -s':

Consonant Cluster	Example
/-ndz/	bands
/-lbz/	bulbs
/-ldz/	welds
/-lmz/	realms
/-lnz/	kilns
/-lvz/	shelves

/t/ is the last consonant in the clusters listed below, which usually represents the past
suffix –(e)d:

Consonant Cluster	Example(s)
/-pst/	lapsed
/-kst/	text, fixed
/-dst/	midst
/-mpt/	dumped
/-nst/	fenced
/-ntʃt/	clinched, drenched
/-ŋkt/	linked
/-lpt/	helped
/-lkt/	milked
/-ltʃt/	belched
/-lst/	repulsed
/-spt/	lisped
/-skt/	asked

/d/ is the final consonant in all the clusters given below, which usually represents the
past suffix (e)d:

Consonant Cluster	Example
/-ndʒd/	changed
/-nzd/	cleansed
/-ldʒd/	bulged
/-lmd/	overwhelmed
/-lvd/	solved

/θ/ is the final element in all the clusters listed below:

Consonant Cluster	Example
/-ksθ/	sixth
/-nkθ/	length
/-lfθ/	twelfth

Final four-consonant clusters (-CCCC)

/s/ or /t/ is the final element in all the consonant clusters listed below; it invariably
represents the suffix –(e)s or the past suffix –(e)d:

Consonant Cluster	Example(s)
/-mpts/	prompts, exempts
/-mpst/	glimpsed
/-lkts/	mulcts
/lpts/	sculpts
/-lfθs/	twelfths
/-ksts/	texts
/-ksθs/	sixths

4.7 LET US SUM UP

In this unit we have described and classified the consonants of English in detail. The phonemes have been classified according to manner and place of articulation, and the state of the glottis. Each consonant phoneme has been sub-classified under the manner of articulation and we have described the allophones of the consonant phonemes. In other words, we have seen that each consonant phoneme is realised differently in different contexts in words and in connected speech. For example, the voiced bilabial plosive /b/ is not fully voiced, or is devoiced when it occurs in the initial position in words such as beak, bat, and in the final position in words such as cub, rib. This /b/ phoneme is, however, fully voiced when it occurs between two vowel sounds, or between two voiced sounds as in ribbon, husband, rub it.

We have said that sequences of consonants that occur within the syllable are called consonant clusters. There are restrictions on the combinatorial possibilities of consonants in every language. Each language has its own restrictions.

We have seen that a syllable must have a vowel element which is obligatory and consonant element which is optional. The number of consonant elements before and after the vowel element vary from language to language. In English the maximum number of consonants permissible before the vowel element is three and the maximum number of consonants permissible after the vowel element is four. Thus the structure of the syllable in English would be like this – C_0-C_3 V C_0-C_4. We have given the combinations of consonants possible in the initial and in the final positions in a syllable in English.

We have also learnt to divide a bi/polysyllabic word into syllables by using a hyphen to indicate syllable division.

Thus after a description of the consonant sounds of English we have examined the next higher unit, viz. the syllable. We have seen that one more syllables constitute the next higher unit, that is, the **word**, just as one or more consonants and a vowel constitute the syllable.

4.8 KEY WORDS

Consonant Cluster: Two or more consonants in a row within a single syllable.

Syllable: A central but elusive unit in phonology. A syllable typically consists of one vowel or diphthong possibly preceded or followed by one or more consonants. Attempts have been made to define the syllable in terms of muscular contractions, neural programming, and in terms of peaks in sonority, but no completely satisfactory definition has been found.

4.9   EXERCISES

I.   Say whether the following statements are true or false.

For example: (I) All vowels in English are voiced (True)

(a)   In English (R.P.) all the plosives are aspirated. (   )

(b)   The English affricate /dʒ/ consists of two phonemes. (   )

(c)   There are 9 fricatives in English. (   )

(d)   A plosive is unexploded when it occurs before another plosive or affricate.
(   )

(e)   In the word coughed the last sound is pronounced /d/. (   )

(f)   In the word arranged the last sound is pronounced /d/. (   )

(g)   The English consonants /m,n,ŋ/ are produced with a velic closure. (   )

(h)   The English consonants /b,d,g/ are fully voiced before vowels. (   )

(i)   The suffix – s and – es in the plural formation of nouns is pronounced /s/
after a voiceless consonant. (   )

(j)   The Dark [ɫ] in English is used whenever the lateral occurs before
consonants. (   )

(k)   The last letter in the words cupboards, and trees is pronounced /s/. (   )

(l)   In the production of /r/ in the English word rose the vocal cords are wide
apart. (   )

(m)   The variety of /r/ often used in the word ferry is called a voiced alveolar flap.
(   )

(n)   No variety of /r/ can be devoiced. (   )

(o)   The consonants /w and j/ do not occur in the final position in words
(   )

II   Describe each of the consonant phonemes in the following words using a
three–term label. Example: pack —— /p/ voiceless bilabial plosive
/k/ voiceless velar plosive

(a) question (b) healthy (c) exist (d) ribbon (e) fingers (f) resist (g) causes (h)
themselves (i) majestic, (j) moustache

III   Give a pair of words to distinguish between each of the following:

Example: /f/ /v/ - fail – veil

/s/, /z/; /s/, /ʃ/; /m/, /ŋ/; /t/, /l/;   /k/, /r/;
/tʃ/, /p/; /f/, /p/; /j/, /w/; /n/, /r/; /v/, /w/.

Note: Remember that the two words for each pair of consonant sounds must differ in respect of one sound only. i.e., the sounds mentioned in each pair. Thus the words fail and veil differ in respect of /f/ and /v/. In each word only one sound differentiates it from the other word. Thus the /f/ in fail differentiates it from veil. The vowel and the last consonant sound are identical in both the words.

IV   Give two examples each of words containing the following allophones of the consonants mentioned below

     (a)   A devoiced /z/
     (b)   A laterally released /t/
     (c)   A nasally released /d/
     (d)   An aspirated /k/
     (e)   A Dark /l/
     (f)   The post-alveolar fricative variety of /r/
     (g)   An unaspirated /p/
     (h)   A fully voiced /b/
     (i)   A voiced labio-dental nasal [m]
     (j)   A voiced dental nasal [ŋ]

V   The following words have the suffix - (e)d. Group them according to the pronunciation of the suffix. Example: parched, parted, judged, quoted, hissed.

/t/	/d/	/ɪd/
parched. hissed	judged	parted, quoted

fished, cautioned, suggested, preached, bowed. fleeced, prompted. ceased, seized, praised, defended, wrestled, dipped, stuffed, collided, grudged, bagged

VI   Arrange the following words in groups according to the pronunication of the suffix – (e)s.

Brushes, watches, tables. filters, bridges, crows, hands, caps, cliffs, ducts, sizes, sharks.

VII   Give two examples each of the following types of syllable

     1)   CCVC
     2)   CCCVCC
     3)   CVCC
     4)   CCVCC
     5)   CCVCCC

VIII   Divide the following English words into syllables. Indicate the syllable division with a hyphen between each. Examples: watches -/ ˈwɒtʃ-ɪz/, colour – ˈkʌ-lə/. Consult the dictionary for the transcription of each word.

Satisfy, excel, created, magazine. methodology, occurrence, negotiate, linguistic, exasperate, discrepancy.

IX   Give two words as examples of the following types of consonant cluster.

     (1)   Initial cluster with two consonants
     (2)   Initial cluster with three consonants
     (3)   Final cluster with two consonants

(4)   Final cluster with <u>three</u> consonants
(5)   Final cluster with <u>four</u> consonants.

X   Using the dictionary, write a phonemic transcription of the following words
      and point out the initial and/or final consonant clusters. Example:-
      tripped/trɪpt/ initial cluster:/tr-/ final cluster:/-pt/

(1)   glanced
(2)   length
(3)   slings
(4)   bruised
(5)   lisps
(6)   smudged
(7)   strands
(8)   quench
(9)   tulip
(10) twists
(11) squall
(12) scratched
(13) sealing
(14) mixed
(15) plinth

4.10   ANSWERS TO EXERCISES

I   (a) false   (e) false   (i) true   (m) true
     (b) false   (f) true   (j) true   (n) false
     (c) true   (g) false   (k) false   (o) true
     (d) true   (h) false   (l) false

II   (a) (i)   /k/ voiceless velar plosive
          (ii)   /w/ voiced labio-velar semi-vowel
          (iii) /s/ voiceless alveolar fricative
          (iv)   /tʃ/ voiceless palato-alveolar affricate
          (v)   /n/ voiced alveolar nasal

     (b) (i)   /h/ voiceless glottal fricative
          (ii)   /l/ voiced lateral approximant
          (iii) /θ/ voiceless dental fricative

     (c) (i)   /g/ voiced velar plosive
          (ii)   /z/ voiced alveolar fricative
          (iii) /s/ voiceless alveolar fricative
          (iv)   /t/ voiceless alveolar plosive

     (d) (i)   /r/voiced post-alveolar approximant or
                 frictionless continuant
          (ii)   /b/ voiced bilabial plosive
          (iii) /n/ voiced alveolar nasal

     (e) (i)   /f/ voiceless labio-dental fricative
          (ii)   /ŋ/ voiced velar nasal
          (iii) /g/ voiced velar plosive
          iv)   /z/ voiced alveolar fricative

(f)   (i)   /r/ voiced post-alveolar approximant
       (ii)   /z/ voiced alveolar fricative
       (iii)   /s/ voiceless alveolar fricative
       (iv)   /t/ voiceless alveolar plosive

(g)   (i)   /k/ voiceless velar plosive
       (ii)   /z/ voiced alveolar fricative
       (iii)   /z/ voiced alveolar fricative

(h)   (i)   /ð/ voiced dental plosive
       (ii)   /m/ voiced bilabial nasal
       (iii)   /s/ voiceless alveolar fricative
       (iv)   /l/ voiced alveolar lateral
       (v)   /v/ voiced labio-dental fricative
       (vi)   /z/ voiced alveolar fricative

(i)   (i)   /m/ voiced bilabial nasal
       (ii)   /dʒ/ voiced palato-alveolar affricate
       (iii)   /s/ voiceless alveolar fricative
       (iv)   /t/ voiceless alveolar plosive
       (v)   /k/ voiceless velar plosive

(j)   (i)   /m/ voiced bilabial nasal
       (ii)   /s/ voiceless alveolar fricative
       (iii)   /t/ voiceless alveolar plosive
       (iv)   /f/ voiceless palato-alveolar affricate

III   Any example of words distinguishing between /s/ and /z/ is pea<u>c</u>e and pea<u>s</u>

IV

/t/	/d/	/ɪd/
fished	cautioned	suggested
preached	bowed	defended
dipped	wrestled	collided
stuffed	grudged	prompted
fleeced	bagged	
ceased	seized	
	praised	

V

/s/	/z/	/ɪz/
caps	tables	brushes
cliffs	filters	watches
ducts	crows	bridges
sharks	hands	sizes

VI   (i) ˈsæ-tɪs-faɪ   (ii) ɪk-ˈsel   (iii) kriː-ˈeɪ-tɪd   (iv) mæ-gə-ˈziːn
       (v) me-θə-ˈdɒ-lə-dzɪ   (vi) ə-ˈkʌ-rəns   (vii) nɪ-ˈgəu-ʃɪ-eɪt
       (viii) lɪŋg-ˈwɪs-tɪk   (ix) ɪg-ˈzæs-pə-reɪt (x) dɪs-ˈkre-pən-sɪ

		lead(metal)		sat		wind		fill		say		**Phonetic**
		dead		that				sill		hay		**Transcription**
		wed		vat				mill		ray		
				hat				chill		may		
				chat						nay		

3.   (a)

(a)	(b)	(c)	(d)	(e)
fill	pet	bun	bead	lack
feel	pit	bin	bid	lick
fell	pat	bean	bed	leak
fall	part	ban	bad	lark
full	pot	barn	bard	lock
fool	port	born	bored	look
fail	put	boon	booed	lurk
foil	pont	burn	bud	luck
file		bane	bide	lake
foul		bone	bowed	
foal			beard	
furl			bared	

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