VOWEL PHONEMES IN HINDI

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Abstract. An analysis of the present day Hindi, as spoken in the northern part of India, brings to light the fact that this language has at least twenty vowel phonemes, and not simply thirteen. Twelve of these twenty vowel phonemes are oral while eight of them are nasalized. Eighteen of them are pure vowels (monophthongs) while two of them are diphthongs. Two of the thirteen vowels included in the current list of alphabet have given place to two consonants with the result that they have ceased to exist. Most of these vowel phonemes occur in all the three positions, namely initial, medial and final, in the Hindi words.

Keywords: consonants, diphthongs, Hindi, meaning, monophthongs, vowel phonemes.

Шарма Брахма Дутта. Голосні фонеми в гінді.

Анотація. Аналіз поточного стану мови гінді, якою розмовляють у північній частині Індії, з'ясовує той факт, що в цій мові є принаймні двадцять голосних фонем, а не тринадцять. Дванадцять із цих двадцяти породжуються голосом, вісім – назалізовані. Вісімнадцять з них – чисті голосні (монофтонги), а дві представлено дифтонгами. Дві з тринадцяти фонем, що включено до чинного алфавіту, поступилися місцем двом приголосним, а тому зникли з переліку. Більшість зі згаданих голосних зафіксовано в усіх трьох позиціях: на початку, всередині та в кінці слова.

Ключові слова: приголосні, дифтонги, гінді, значення, монофтонги, голосні фонеми.

1. Introduction

There is no unanimity among the linguists on the question as to how many vowel phonemes the Hindi language has. If one of them identifies only ten vowel phonemes in Hindi, there is another who identifies thirteen. And in most of the text books of Hindi grammar they give a list of twelve vowel phonemes. Therefore there exists the need of a thorough phonetic analysis of the language and a fresh effort to identify all the vowels of Hindi. It was in this context that I resolved to take up this task of finding out how many vowel phonemes the current Hindi has.

Since I am a native speaker of Hindi and have been using it during my seventy-six year long stay in the Hindi heart-land I have every right to trust my intuition to arrive at conclusions about this language of mine. Since this language is being used by at least 500 million people in India alone, I thought, I would be serving a very large section of humanity by this research of mine. I consider myself qualified to do this job also because I have a forty year long experience of teaching linguistics in colleges and universities both at home in India and overseas.

1.1. The Study
1.2. Survey of Literature

John Shakespear identifies fourteen vowels in Hindustani alphabet but he mentions only ten of them while discussing pronunciation (Shakespear, 1845:6-12). There are two editions of Duncan Forbes' book of grammar one published in 1846 and another in 1856. Both of them largely deal with Urdu but a small discussion on the Devanagari script is also there in them. Duncan concerns himself with the Devanagari alphabet largely and there is no discussion about the sounds in either edition of the book. According to him: "The alphabet, as used for the Hindustani, consists of eleven vowel sounds, and thirty-three consonants" (Duncan, 1846:136) though in the plate that follows he has given fourteen vowels under the title Devanagri Alphabet. Tweedie identifies eight vowels (three short, five long vowels and no diphthongs) in Hindustani (Tweedie, 1900:3-4). Pahwa maintains that there are in all ten vowel sounds in the language [Hindustani]: three short vowels, five long vowels and two diphthongs (Pahwa, 1919:16-17).

Now let me turn my attention to the books that have Hindi in their title. In his *Hindi Vyakaran [Grammar of Hindi]* (1920) Kamta Prasad Guru identifies eleven vowels of which four (अ, इ, उ and ऋ) are short vowels, three (आ, ई, ऊ) long vowels and four (ए, ऐ, ओ, औ) diphthongs (Guru, 2009:46). Ram Lochan Sharan in his *Hindi Vyakaran Chandrodaya* considers twelve vowel sounds in Hindi which he further classifies as five short (अ, इ, उ, ए and ऋ) and seven long vowels (आ, ई, ऊ, ॠ, ऐ, ओ, औ, ॡ and ऋ). He also opines that four of these (ए, ऐ, ओ, औ) may also be called diphthongs (Sharan, 1920:5). Greaves writes: "The Hindi Alphabet differs but slightly from the Sanskrit. Indian grammarians are not unanimous in their views as to the number of the letters. For practical purposes, the number of the letters may be taken as 46, i.e., 11 vowels and 35 consonants. The 3 vowels ऋ, ऌ, ॡ rí, lri and lrí, are pure Sanskrit and have no place in Hindi." (Greaves, 1921: 8) Suniti Kumar Chatterji uses the two terms viz. Hindi and Hindustani as synonyms and identifies three short (अ, इ, उ), five long (आ, ई, ऊ, ए, ओ) vowels and two diphthongs (ऐ, औ) in it (Chatterjee, 1942:139). Bhola Nath Tiwari has also identified 11 vowel sounds (अ, इ, उ, आ, ई, ऊ, ए, ओ, ऐ, औ, ऋ) in Hindi (Tiwari, 1958:5). While discussing Hindi alphabet Ram Chandra Verma in his *Manak Hindi Vyakaran* identifies 13 vowel letters of which four short vowels (अ, इ, उ and ऋ), long vowels (आ, ई, ऊ) and four diphthongs (ए, ऐ, ओ, औ) in Hindi; he does not take into account अं and अः and discards them as they are not independent/pure vowels (Verma, 1994:8). Aryendra Sharma in his book identifies eleven vowels in Hindi. He also writes that any vowel "short or long can be nasalized." (Sharma, 1994:3-5) Rama Kant Agnihotri writes: "There are 10 short and long vowel sounds in Hindi." (Agnihotri, 2007:240) He asserts that the eleventh vowel ऋ exists in writing but has disappeared in speech (Agnihotri, 2007:243). Agnihotri further claims, "All vowel sounds also have their nasalised counterparts" (Agnihotri, 2007:243) and exemplifies them (Agnihotri, 2007:250-51). O N Kaul writes: "It

[Hindi] has ten vowels…All vowels can be nasalized and nasalization is phonemic (Koul, 2008:4). Kaul mentions 10 oral and 10 nasal vowels in it. He writes, "Nasalization is phonemic in Hindi. All the vowels can be nasalized." (Koul, 2008:11) Uday Narayan Tiwari has identified six short (अ, ऑ, इ, उ, ऍ, ऑ) and seven long vowels (आ, ई, ऊ, ए, ओ, ऐ, औ) in Hindi. He further writes that all the vowel sounds of Hindi are used in the nasalised form also (Tiwari, 2009:242). Kapildev Dwivedi has identified 54 phonemes in Hindi of which the following 10 are the vowels: "अ आ इ ई उ ऊ ए ओ ऐ (अइ) औ (अउ)" (Dwivedi, 2016:148)

2. Methods

The data for analyzing the sounds was collected from the written as well spoken texts by the native speakers in a random manner. It was analysed by using comparison and contrast method.

3. Results and Discussion

Nasalisation of a phoneme in Hindi is a unique feature of the language. Nasal consonants that are independent phonemes are represented by separate graphemes but it is not the case with nasal vowels as is clear from the following figures:

Table 1

(Source: https://en.wikipedia.org/wiki/Devanagari)

Fig. 1.
(https://www.wikihow.com/Learn-Hindi)

Since the article focuses on phonemes a description of the script/grapheme is beyond its purview and therefore is not being discussed in detail. The fact remains that nasalization exists in common man's speech and the same is being discussed here. The nasalised vowels are not considered to be independent phonemes and therefore no separate graphemes have been identified for them unlike the case with consonants. Nasalisation is phonemic in Hindi and different linguists have given different numbers. The nasalised vowel phonemes are different from the oral vowel phonemes. Thus one has to concede that the number of vowel phonemes which occur in Hindi is twenty. The details are shown in the following table:

Table 2

Total N of vowels in Hindi: 20	Hindi vowel graphemes	Hindi vowels in IPA
Oral monophthongs: (10) (a part of Hindi alphabet)	अ, आ, इ, ई, उ, ऊ, ए, ऐ, ओ, औ	/ə, ɑ:, ɪ, i:, u, u:, ė, ɛ, o, ɔ /
Oral diphthongs: (2) (not a part of Hindi alphabet)	अइ, अउ	/əɪ, əʊ /
Nasal monophthongs: (8) (not a part of Hindi alphabet)	अँ, आँ, इँ, ईँ, उँ, ऊँ, एँ, औँ	/ə͂, ɑ:͂, ɪ◌̃, i:͂, ũ, ũ:, ɛ̃, ɔ̃/

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While ten of them are pure vowels or oral monophthongs, two are oral diphthongs eight of them, namely (अँ, आँ, इँ, ईँ, उँ, ऊँ, एँ, औँ) are nasalized vowel phonemes. Let us now describe them. First of all let us take up the oral monophthongs:

1.   /ə/ (अ)

The vowel phoneme /ə/ is a central or middle phoneme as in order to articulate it the middle part of the tongue is raised to a point exactly in the middle of the half-close and half-open positions, the lips remain unrounded and the air is released only through the oral cavity as the soft palate is raised to close the nasal passage. This vowel sound occurs in Hindi words in all the three, namely, initial, medial and final positions. For example, it occurs in the initial position as the opening syllable in the following words:

/ ənɑ:r /	अनार	(=pomegranate)
/ əmi:r /	अमीर	(=rich)
/ əlu:tʃɑ: /	अलूचा	(=plum)
/ əkelɑ: /	अकेला	(=alone)
/ ənɔkʰɑ: /	अनोखा	(=unique)

it occurs in the medial position as the terminating sound of the first syllable in the following words:

/məkɑ:n /	मकान	(=house)
/həl/	हल	(=plough; solution)
/pʰəl/	फल	(=fruit; result);

And it occurs in the final position as the terminating sound of the last syllable in the following words:

/pəvɪt̪rə/	पवित्र	(=sacred; pious)
/tʃərɪt̪rə /	चरित्र	(=character)
/mɪt̪rə/	मित्र	(=friend)

2.   /ɑ:/ (आ)

The Hindi vowel phoneme /ɑ:/ is a back vowel as in order to articulate it the back part of the tongue is kept at the open position, the lips remain neutral and the soft palate is raised so as to close the nasal passage with the result that the air is allowed to escape only through the oral passage. This vowel phoneme figures in all

the three positions in initial words. For example, it occurs in the initial position as the opening syllable in the following words:

| /ɑ:m / | आम | (=mango) |

/ɑːʃɑː/	आशा	(=hope)
/ɑːd̪ər/	आदर	(=respect)
/ɑːju /	आयु	(=age)

It occurs in the medial position as the terminating sound of a syllable in the following words:

/ɪnɑːm/	इनाम	(=prize)
/ɑːrɑːm/	आराम	(=comfort)
/burɑːd̪ɑː/	बुरादा	(=saw-dust);

and it occurs in the final position as the terminating sound of the last syllable in words like:

/mɑːt̪ɑː/	माता	(=mother)
/pɪt̪ ɑː/	पिता	(=father)
/bʰrɑːt̪ɑː/	भ्राता	(=brother)
/vɪd̪ʰɑːt̪ ɑː/	विधाता	(=creator)

3.   /ɪ/ (इ)

The vowel phoneme /ɪ/ is a front vowel and in order to articulate it the retracted front part of the tongue is raised to a point slightly above the half- close position, the lips remain spread and the soft palate is raised so that the nasal passage is closed and the air escapes through the oral passage alone. This vowel phoneme occurs in all the three positions in the Hindi words. For example, it occurs in the initial position as the opening syllable in the following words:

/ɪt̪ɪhɑːs/	इतिहास	(=history)
/ɪmlɑː/	इमला	(=dictation)
/ɪt̪ɪ/	इति	(=end);

it occurs in the medial position as the terminating sound of some syllable in the following words:

/pəvɪt̪rə/	पवित्र	(=holy)
/tʃərɪt̪rə /	चरित्र	(=character)
/səvɪt̪ɑː/	सविता	(=sun); and

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it occurs in the final position as the terminating sound of the last syllable in the following words:

/həɾɪ/	हरि	(=the Supreme Being)
/gɪɾɪ/	गिरि	(=mountain)
/ɪt̪ɪ/	इति	(=end)
/ɑ:d̪ɪ/	आदि	(=beginning).

4.   /i:/ (ई)

The vowel phoneme /i:/ is a front vowel and in order to articulate it the advanced front part of the tongue is raised to a point slightly below the close position, the lips are spread, and the soft palate is raised so that the nasal passage is closed and the air escapes through the oral cavity alone.

This vowel phoneme occurs in all the three positions in Hindi words. For example it occurs in the initial position as the initial syllable in the following words:

/i:mɑ:n/	ईमान	(=probity)
/i:ʃɑ:n/	ईशान	(=north-east)
/i:ʃvər /	ईश्वर	(=the Supreme Being);

it occurs in the medial position as the terminating sound of some syllable in the following words:

/pəɾɪ:kʃɑ:/	परीक्षा	(=examination)
/d̪i:kʃɑ:/	दीक्षा	(=training)
/mi:l/	मील	(=mile);

and it occurs in the final position as the terminating sound of the last syllable in the following words:

/gəli:/	गली	(=street)
/bʰəli:/	भली	(=gentle [feminine gender])
/həɾi:/	हरी	(=green [feminine gender])
/səhi:/	सही	(=right)

5.   /u/ (उ)

The vowel phoneme /u/ is a back vowel in order to articulate which the back part of the tongue near the centre is raised to a point slightly above the half-close position, the lips are rounded, and the air escapes exclusively through the oral passage.

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This vowel phoneme occurs in all the three positions in English words. For example, it occurs in the initial position as the opening syllable in the following words:

/ullu:/	उल्लू	(=owl)
/upɑ:sənɑ:/	उपासना	(=worship)
/ust̪ərɑ:/	उस्तरा	(=razor);

it occurs in the medial position as the terminating sound of some syllable in the following words:

/pust̪ək/	पुस्तक	(=book)
/d̪ʰuɑ:ँ̃/	धुआं	(=smoke)
/bun/	बुन	(=knit);

and it occurs in the final position as the terminating sound of the last syllable in the following words:

/ʃət̪ru/	शत्रु	(=enemy)
/kʰlu/	खलु	(=definitely)
/hənu/	हनु	(=chin).

6.   /u:/ (ऊ)

The vowel phoneme /u:/ is a back vowel. In order to articulate this vowel sound the far back part of the tongue is raised to a point slightly below the close position, the lips are rounded and the air is allowed to escape only through the oral passage.

This speech sound occurs in all the three positions in Hindi words. For example, it occurs in the initial position as the opening syllable in the following words:

/u:t̪ək/	ऊतक	(=tissue)
/u:ʃɑ:/	ऊषा	(=dawn)
/u:sər/	ऊसर	(=barren);

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following words:

/su:ər/	सूअर	(=hog)
/tʃu:hɑ:/	चूहा	(=rat)
/ru:s/	रूस	(=Russia);

and it occurs in the final position as the terminating sound of the last syllable in the following words:

/tʃɑ:ku:/	चाकू	(=knife)
/kɑ:d͟ʒu:/	काजू	(=cashew nut)
/bʰɑ:lu:/	भालू	(=bear).

7.   /ė/ (ए)

The Hindi vowel phoneme /ė/ is a front vowel as in order to articulate it the advanced front part of the tongue is raised to a point slightly above the half-close position, the lips are kept in the spread shape and the air is allowed to escape only through the oral passage.

This vowel phoneme occurs in all the three positions in Hindi words. For example, it occurs in the initial position as the opening syllable in the following words:

/ėk/	एक	(=one)
/ėṟi:/	एड़ी	(=heel)
/ėkɑ:n̯t /	एकांत	(=solitude);

it occurs in the medial position as the terminating sound of some syllable in the following words:

/bėl/	☐☐☐	(=creeper)
/prėm/	☐☐☐☐☐	(=love)
/mėl/	☐☐☐	(=friendship);

and it occurs in the final position as the terminating sound of the last syllable in the following words:

/ləṟkė/	☐☐☐☐	(=boys)
/ɑ:pk ė/	☐☐☐☐	(=yours)
	☐☐☐☐ !	

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8. /ɛ/ (ऐ)

The vowel phoneme / ɛ / is a front vowel as in order to articulate it the advanced front part of the tongue is raised to the half-open position the lips are kept neutrally spread and the air is allowed to escape through the oral cavity.

This Hindi vowel phoneme figures in all the three positions. For example, it figures in the initial position as the opening syllable in the following words:
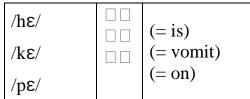
/ɛnək /	☐☐☐	(=spectacles)
	☐☐	(=luxury)
/ɛʃ /	☐☐☐☐☐	(=Erawat [a name]);

/ɛrɑːʊə̯t̪/		

it occurs in the medial position as the terminating sound of some syllable in words like:

/d̠ʒɛsɑː/	□□□□ □□□□ □□□□	(=like) (=how) (=money).
/k̠ɛsɑː/		
/p̠ɛsɑː/		

And it occurs in the final position as the terminating sound of the last syllable in words like:

/hɛ/	□□ □□ □□	(= is) (= vomit) (= on)
/kɛ/		
/pɛ/		

It makes pairs of sounds:

/hɛ/ and /hɛ̃/	□□□ (= are) □□□ (= a cry of pain) □□□ (= a sound of a horn)	□□ (=is) □□ (=vomit) पैं (=on)
/kɛ/ and /kɛ̃/		
/pɛ/ and /pɛ̃/		

9.   /o/ (ओ)

This Hindi phoneme is a back vowel and in order to articulate it the far back part of the tongue is raised to the half-close position, the lips are rounded, and the air is allowed to escape through the oral passage. It occurs in all the three, (namely, initial, medial, and final) positions in Hindi words. For example, it occurs in the initial position as the opening syllable in the following words:

/ol ɑː/	□□□	(=hail)

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/os/	□□	(=dew);

it occurs in the medial position as the terminating sound of some syllable in the following words:
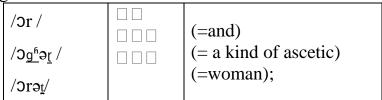
/k̠ʰol/	□□□	(= open)
/g̠ol/	□□□	(= round)
/b̠ol/	□□□	(= speak (v.i.);

and it occurs in the final position as the terminating sound of the last syllable in words like:

/lo/	□□ □□□	(=take) (=go)

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/d̠ʒɑ:o/ /roo/	☐☐☐	(=weep)

10.   /ɔ/ (औ)

This vowel phoneme is a back vowel in order to articulate which the back part of the tongue is raised to the half-open position, the lips are rounded and the air is allowed to escape only through the oral passage. It occurs in all the three positions in Hindi words. For example, it occurs in the initial position as the opening syllable in the following words:

/ɔr / /ɔg̠ʰə̠ɾ / /ɔrə̠t/	☐☐ ☐☐☐ ☐☐☐	(=and) (= a kind of ascetic) (=woman);

it occurs in the medial position as the terminating sound of some syllable in words like:

/mɔd̠ʒ / /dɔlɑ:/ /hɔlɛ/	☐☐☐ ☐☐☐☐ ☐☐☐☐	(=happiness); (=a raised boundary line) (=slowly)

and it occurs in the final position as the terminating sound of the last syllable in words like:

/sɔ/ /pɔ/ /rɔ/ /lɔ/	☐☐ ☐☐ ☐☐ ☐☐	(=hundred) (=dawn) (=flood) (=flame).

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Now I come to the oral diphthongs:

11.   /əɪ/ (अइ)

This Hindi vowel phoneme is a diphthong in order to articulate which the tongue glides from the /ə/ position (central, exactly between half-open and half-close, unrounded) towards the /ɪ/ position (front, close, unrounded). It occurs in words like:

/g̠əɪjɑ:/ /m̠əɪjɑ:/ /b̠ʰəɪjɑ:/	☐☐☐☐ ☐☐☐☐ ☐☐☐	(=cow) (=mother) (=brother).

12.   /əʊ/ (अउ)

This vowel phoneme of Hindi is a diphthong in order to articulate which the tongue glides from the /ə/ position (central, between half-open and half-close, unrounded) towards the /u/ position (far back, close, rounded). It occurs in the medial position in words like;

/kəʊɑ:/	□□□	(=crow)
/həʊɑ:/	□□□	(=a terrifying object/ person)
/pəʊɑ:/	□□□	(=one fourth);

and it occurs in the final position as the terminating sound of the final syllable in words like:

| /g̠əʊ/ | गौ | (=cow). |

Now I come to the nasalized vowel phonemes:

13.   /ə̃/ (अँ)

The Hindi vowel phoneme /अँ/ is the nasalized form of the vowel phoneme /ə̃ /. When we articulate it the middle part of the tongue is raised to a point exactly between the half-close and the half-open positions, the lips remain neutral and the air flows outwards through both the oral and the nasal passages. It occurs in the initial position in words like:

/ə̃g̠u:ʈʰi:/	अँगूठी	(=ring)
/ə̃g̠ərk̠ʰɑ:/	अँगरखा	(=cloak)
/ə̃g̠rėz/	अँग्रेज़	(=Englishman)
/ə̃g̠i:ʈʰi:/	अँगीठी	(=grate);

and it occurs in the medial position in words like:

| /fə̃sna/ | फँसना | (=to get entangled) |
| /h̠ə̃snɑ:/ | हँसना | (=to laugh) |

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This vowel phoneme is different from the cluster /əŋ/ which occurs in the initial position in words like /əŋg/ अङ्गूर (=grape), /əŋg/ अङ्ग (=limb), and /əŋk/ अङ्क (=number).

That the vowel phoneme /ə̃/ is different from /ə/ comes to light when we find that the replacement of one by the other in a word changes its meaning. Here are some examples to illustrate the fact:

Words in pair with /ə/ & /ə̃/	Words with /ə/	Words with /ə̃/
/rəg/ & / rə̃g/	रग (=nerve)	रँग (=colour)

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/əgər kʰɑː/ & /əgə̃ rkʰɑː/	अगर खा (=eat the agar)	अँगरखा (=cloak)
/bəd̪ʰ/ & /bə̃d̪ʰ/	बध (=murder)	बँध (=get tied)
/kəd̪/ & /kə̃d̪/	कद (=height)	कँद (=get scratched)
/səd͡ʒən/ & /sə̃d͡ʒən/	सजन (= beloved)	सँजन (= to collect)
/səd͡ʒonɑː/ & /sə̃d͡ʒonɑː/	सजोना (=Do beautify yourself)	सँजोना (= to put in order)
/d͡ʒətʃənɑː/ & /d͡ʒə̃tʃənɑː/	जचना (= to look smart)	जँचना (= to get examined)

In each of these cases the first syllable of the word in the first list has the vowel /ə/ but it has been replaced by /ə̃/ in the word in the second list with the result that the meaning of the word has changed.

14.   /ɑː̃/ (आँ)

The vowel phoneme /ɑː̃/ is the nasalized form of /ɑː/. This vowel phoneme is a back vowel and in order to articulate it one raises the retracted back part of the tongue to the open position, keeps the lips in the neutral or unrounded shape and lets the air flow out through both the oral and the nasal passages. This phoneme occurs in all the three positions in the Hindi words. For example it occurs in the initial position as the initial syllable in the following words:

/ɑː̃tʃ/	आँच	(=fire)
/ɑː̃kʰ/	आँख	(=eye)
/ɑː̃knɑː/	आँकना	(=to estimate)
/ɑː̃s/	आँस	(=dissonance), and
/ɑː̃t/	आँट	(=restriction).

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words like:

/pʰɑː̃knɑː/	फाँकना	(=to throw into the mouth)
/hɑː̃fnɑː/	हाँफना	(=to pant)
/sɑː̃p/	साँप	(=snake)
/pʰɑː̃sː/	फाँस	(=wedge)
/bɑː̃s/	बाँस	(=a kind of reed plant)
/bʰɑː̃g/	भाँग	(=a drug)
/t̪ɑː̃bɑː/	ताँबा	(= copper)
/kɑː̃tʃ/	काँच	(=rectum; glass), and
	धाँस	(=a small splinter of wood);

/ḍʰɑ:ə̃s/		

and it occurs in the final position as the terminating sound of the last syllable in words like:

/h̠ɑ:ə̃/	हाँ	(=yes)
/kəhɑ:ə̃/	कहाँ	(=where)
/d̠ʒəhɑ:ə̃/	जहाँ	(=universe)
/ḍʰuɑ:ə̃/	धुआं	(=smoke), and
/d̠u:ɑ:ə̃/	दूआं	(=a type of mustard seed).

This nasalized form of the Hindi vowel phoneme /ɑ:/ is different from the vowel phoneme /ɑ:ə̃/ because the replacement of one by the other changes the meaning of the word in a large number of cases. Here are some of the examples:

Word with /ɑ:/	Word with /ɑ:ə̃/
/ɑ:k̠ʰ/ आख (=a herb)	/ɑ:ə̃k̠ʰ/ □□□ (=eye)
/kɑ:s/ कास (=cough)	/kɑ:ə̃s/ काँस (=a plant)
/kəhɑ:/ कहा (=uttered)	/kəhɑ:ə̃/ कहाँ (=where)
/b̠ʰɑ:p/ भाप (=vapour)	/b̠ʰɑ:ə̃p/ भाँप (=sense)
/bɑ:t/ बाट (=footpath)	/bɑ:ə̃t/ बाँट (=divide)
/bɑ:s/ बास (=bad smell)	/bɑ:ə̃s/ बाँस (=bamboo)
/sɑ:g̠/ साग (=curry of leaves)	/sɑ:ə̃g̠/ साँग (=drama)
/b̠ʰɑ:g̠/ भाग (=portion; run)	/b̠ʰɑ:ə̃g̠/ भाँग (=Indian hemp)
/p̠ʰɑ:k̠ɑ:/ फाका (=starvation)	/p̠ʰɑ:ə̃k̠ɑ:/ फाँका (=threw into mouth)

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/sɑ:t̠ʰ/ साठ (=sixty)	/sɑ:ə̃t̠ʰ/ साँठ (a herb)
/k̠ɑ:tʃ/ काच (=dirty mud)	/k̠ɑ:ə̃tʃ/ काँच (=glass)
/p̠ɑ:kʰ/ पाख (=fortnight)	/p̠ɑ:ə̃kʰ/ पाँख (=wing)
/kʰɑ:s/ खास (=chief)	/kʰɑ:ə̃s/ खाँस (=cough)
/sɑ:s/ सास (=mother-in-law)	/sɑ:ə̃s/ साँस (=breath)
/dɑ:t/ डाट (=cork)	/dɑ:ə̃t/ डाँट (=snub)
/bɑ:s/ बास (=bad smell)	/bɑ:ə̃s/ बाँस (=bamboo)
/sɑ:g̠/ साग (=leaf curry)	/sɑ:ə̃g̠/ साँग (=stage play)
/p̠ʰɑ:t/ फाट (=cleave)	/p̠ʰɑ:ə̃t/ फाँट (= to smash of an edible)

/bɑ:t/ बाट (=footpath)	/bɑ:t̃/ बाँट (=distribute)
/bʰɑ:ɽ/ भाड़ (=furnace)	/bʰɑ:̃ɽ/ भाँड़ (=jester)
/pɑ:s/ पास (=near)	/pɑ:̃s/ पाँस (=trap)
/dʒʰɑ:g/ झाग (=foam)	/dʒʰɑ:̃g/ झाँग (=lop; prune)
/rɑ:g/ राग (=song; tune)	/rɑ:̃g/ राँग (a metal)
/bʰɑ:dʒʰi:/ भाजी (=vegetable curry)	/bʰɑ:̃dʒʰi:/ भाँजी (=adverse comment)
/bɑ:j/ बाय (=a disease)	/bɑ:̃j/ बाँय (=babble)
/ɑ:kɑ:/ आका (=boss)	/ɑ:̃kɑ:/ आँका (=estimated)
/rɑ:dʰ/ राध (=pus)	/rɑ:̃dʰ/ राँध (=cook by boiling)
/ɑ:dʰi:/ आधी (=half [feminine])	/ɑ:̃dʰi:/ आँधी (=dust storm)
/kʰɑ:/ खा (=eat)	/kʰɑ:̃/ खाँ (a surname of a clan)
/hɑ:/ हा (an interjection)	/hɑ:̃/ हाँ (=yes)
/kɑ:/ का (=what)	/kɑ:̃/ काँ (=whelp; caw)
/bɑ:g/ बाग (=garden)	/bɑ:̃g/ बाँग (=crow)
/hɑ:j/ हाय (an interjection of grief)	/hɑ:̃j/ हाँय (=affirmation)
/bɑ:dʰɑ:/ बाधा (=obstacle)	/bɑ:̃dʰɑ:/ बाँधा (=fastened)
/kəhɑ:/ कहा (=uttered)	/kəhɑ:̃/ कहाँ (=where)
/d̪ɑ:t̪/ दात (=dowry)	/d̪ɑ:̃t̪/ दाँत (=tooth)
/d̪ɑ:t̪ɑ:/ दाता (=giver)	/d̪ɑ:̃t̪ɑ:/ दाँता (= a tooth-like part)
/sɑ:ki:/ साकी (=a maid serving wine)	/sɑ:̃ki:/ साँकी (an agricultural tool)
/ɑ:tɑ:/ आटा (=flour)	/ɑ:̃tɑ:/ आँटा (=filled{with earth})
/gʰɑ:ti:/ घाटी (=valley)	/gʰɑ:̃ti:/ घाँटी (a disease)
/mɑ:/ मा (=no)	/mɑ:̃/ माँ (=mother)
/nɑ:d̪/ नाद (=sound)	/nɑ:̃d̪/ नाँद (=tub)

15.   / ɪ̃/ (इं)

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centre is raised to a point slightly above the half-close position, the lips are kept loosely spread and the air is allowed to flow out through both the oral and the nasal passages. It occurs in the initial position as the first syllable in the following word:

/ɪ̃glɑ:s/	इंग्लास	(=the court of a judge)

It occurs in the medial position as the last sound of some syllable in the following words:

/kʰɪ̃tʃənɑː/	खिंचना	(= to get drawn/ pulled)
/bɪ̃dʰənɑː/	बिंधना	(= to get pierced through)
/sɪ̃tʃɑːi/	सिंचाई	(= irrigation)
/bʰɪ̃tʃənɑː/	भिंचना	(= to get sandwiched)

This vowel phoneme is different from /ɪ̃/ as the replacement of one by the other in several Hindi words results in the change of meaning. Here is an example:

/ɪglɑːs/ इग्लास (= the name of a town)	/ɪ̃glɑːs/ इंग्लास (=a judge's court).

16.   /iː̃/ (ईं)

This vowel phoneme is the nasalized form of the oral vowel phoneme /iː/. In order to articulate it the advanced front part of the tongue is raised to a point slightly below the close position, the lips remain spread, and the air is allowed to flow out through both the oral and the nasal passages. This phoneme occurs in all the three positions. For example, it figures in the initial position as the opening syllable in the following words:

/iː̃t/	ईंट	(=brick),
/iː̃ʈ/	ईंत	(=an insect like mosquito)
/iː̃gur/	ईंगुर	(=vermilion);

it occurs in the medial position as the last sound of some syllable in words like:

/siː̃tʃnɑː /	सींचना	(=to irrigate)
/d̪ʰiː̃g/	धींग	(=stout)
/hiː̃g/	हींग	(=asafoetida)
	भिं	(=sandwich tightly);

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and it figures in the final position as the terminating sound of the last syllable in words like:

/t̪ʰiː̃/	थीं	(=were [plural feminine])
/d̪iː̃/	दीं	(=gave [plural feminine])
/kəhiː̃/	कहीं	(=somewhere).

The vowel sounds /iː/ and /iː̃/ are contrastive as the replacement of one by the other changes the meaning of the word in many cases. Here are a few examples:

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words with /iː/		words with /iːɪ̃/	
/t̪ʰiː/ □□	(= was)	/t̪ʰiːɪ̃/ □□□	(=were [plural feminine])
/d̪iː/ दी	(=gave)	/d̪iːɪ̃/ दीं	(=gave [plural feminine])
/kəhiː/ कही	(=said)	/kəhiːɪ̃/ कहीं	(=somewhere).
/səhiː/ सही	(=correct)	/səhiːɪ̃/ सहीं	(=tolerated)
/siːt̪ɑː/ सीता	(=a [female name)	/siːɪ̃t̪ɑː/ सींता	(=sew/ stitch)
/piː/ पी	(=drink)	/piːɪ̃/ पीं	(=a sound of horn)
/bʰiː t̪/ भीत	(= vexed)	/bʰiːɪ̃t̪/ भींत	(=wall)

17.   /ũ/ (उँ)

The vowel sound /ũ/ is produced when the back part of the tongue is raised to a point slightly above the half close position, the lips are rounded and the air escapes through both the oral and the nasal passages. This vowel phoneme occurs in the initial and medial positions in Hindi words. It figures in the initial position in the following Hindi words:

/ũɡlɪ/	उँगली	(=finger)
/ũɡɑːiː/	उँगाई	(=overhauling)
/ũd̪ʰɑːiː/	उँधाई	(=spilled)
/ũɡɑːjė/	उँगाये	(=drowsy)

The sound occurs in medial position in words like:

/tʃũsɑːiː/	चुँसाई	(=sipping)
/rũd̪ʰɑːiː/	रूँधाई	(=kneading)
	गँधाई	(=kneading)

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This vowel phoneme is different from the vowel phoneme /u/ as the replacement of one by the other in a Hindi word results in the change of meaning. Here is an example:

Words with /u/	Words with /ũ/
/ugəli:/ उगली (= vomited)	/ũgli:/ उँगली (=finger)
/ugɑːjė/ उगाये (= grew)	/ũgɑːjė/ उँगाये (=drowsy)
/ugvɑːjė/ उगवाये (= made [one] grow)	/ũgvɑːjė/ उँगवाये (made [one] overhaul)

18.   /ũː/ (ऊँ)

The vowel phoneme /ũ:/ is a back vowel and in order to articulate it the far back part of the tongue is raised to a point slightly below the close position, the lips are rounded and the air is allowed to escape through both the oral and the nasal passages. This vowel phoneme occurs in all the three positions in English words. For instance, it figures in the initial position as the opening syllable in the following words:

/ũ:ṭ/	ऊँट	(=camel)
/ũ:tʃɑ:/	ऊँचा	(=high)
/ũ:gʰ/	ऊँघ	(=doze);

It figures in the medial position as the terminating sound of some syllable in such words as the following ones:

/pũṭʰ/	पूँछ	(=tail)
/ tʃũs/	चूँस	(=suck)
/bũḏ /	बूँद	(= a drop)
/sũṭ/	सूँत	(=drink through the nose);

and it figures in the final position as the terminating sound of the last syllable in words like:

/hũ:/	हूँ	(=am)
/dʒɑ:ũ:/	जाऊँ	(=[May I] go?
/kʰəɽɑ:ũ:/	खड़ाऊँ	(=wooden slippers).

The vowel phoneme /u:/ and /ũ:/ are contrastive as the replacement of one by

example, in the following cases:

word with /u:/ in it		word with /ũ:/ in it	
/bu:t/	बूट (=shoe)	/bũ:t/	बूँट (=gram pod)
/su:ṭ/	सूत (=yarn)	/sũ:ṭ/	सूँत (=drink)
/ku:tʃ/	कूच (=departure)	/kũ:tʃ/	कूँच (=pierce)
/pu:dʒɑ:/	पूजा (=worship)	/pũ:dʒɑ:/	पूँजा (=strand of hemp)
/ru:s/	रूस (=Russia)	/rũ:s/	रूँस (= feel offended)
/hu:s/	हूस (=uncultured)	/hũ:s/	हूँस (=thrash)
/gʰu:s/	घूस (=bribe)	/gʰũ:s/	घूँस (=thrust)

19.   /ɛ̃/ (ऐं)

The Hindi vowel phoneme /ɛ̃/ is a front vowel in order to articulate which the advanced front part of the tongue is raised to the half-open position, the lips remain spread, and the air is allowed to flow out through both the oral and the nasal passages. This vowel phoneme occurs in all the three positions in Hindi words. For instance, it occurs in the initial position as the opening syllable in the words like:

/ɛ̃ʈʰ/	ऐँठ	(=snobbery)
/ɛ̃tʃəkʈɑːnɑː/	ऐँचकताना	(=misshaped);

it occurs in the medial position as the terminating sound of some syllable in words like:

/pɛ̃ʈʰ/	पैंठ	(=temporary market)
/sɛ̃d̪ʱ/	सैंध	(=break into)
/gɛ̃d̪/	गेंद	(=ball);

and it occurs in the final position in words like:

/pəɽʰɛ̃/	पढ़ें	(=[let them] read)
/bolɛ̃/	बोलें	(=[let them] speak)
/kərɛ̃/	करें	(=[let them] do).

The vowel /ɛ̃/ is a phoneme different from /ɛ/ as the replacement of one by the other results in the change of meaning. For example, this happens in the following

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Word with /ɛ̃/	word with /ɛ/
/pɛ̃ʈʰ/ पैंठ (=temporary market)	/pɛʈʰ/ पैठ (=access)
/sɛ̃t̪/ सैंत (=gratis)	/sɛt̪/ सैत (=honey)
/hɛ̃/ हैं (=are)	/hɛ/ है (=is)
/pɛ̃d̪ɑː/ पैंदा (=bottom lid)	/pɛd̪ɑː/ पैदा (=produce)

20. /ɔ̃/ (औं)

The Hindi vowel phoneme /ɔ̃/ is a back vowel and in order to articulate it the back part of the tongue is raised to the half-open position, the lips are rounded and

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the air flows out through both the oral and the nasal passages. It occurs in all the three positions. For instance, it occurs in the initial position as the initial syllable in words like:

/ɔ̃gʰnɑ:/	औँघना	(=to doze)
/ɔ̃d̪ʰɑ:/	औँधा	(=upside down)
/ɔ̃g/	औँग	(=overhaul);

It occurs in the medial position as the terminating sound of some syllable in words like:

/sɔ̃pnɑ: /	सौंपना	(=to give custody [to])
/pɔ̃tʃʰnɑ:/	पौंछना	(=to wipe)
/bʰɔ̃knɑ: /	भौंकना	(=to bark);

and it occurs in the final position as the terminating sound of the final syllable in words like:

/bʰɔ̃/	भौं	(=eye-brow)
/hɔ̃/	हौं	(=I)
/pɔ̃p ɔ̃/	पौं-पौं	(=motor-car)

This vowel phoneme is different from / ɔ / as one's replacement by the other in a Hindi word changes the meaning of the word. Here are some examples which illustrate this fact:

	Word with / ɔ̃ /	word with / ɔ/
/pɔ̃/ & /pɔ/	पौं (=the sound of the horn)	पौ (=dawn)
/sɔ̃/ & /sɔ/	सौं (=swear)	सौ (=hundred)
/lɔ̃/ & / lɔ/		

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4. Conclusions

Thus one has to concede that there are twenty vowel phonemes in Hindi though some of them do not find a representation in Devanagari alphabet and in writing they are represented by slightly modified forms of the nine prevalent graphs.

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