

## **SCRIPT GRAMMAR FOR ASSAMESE LANGUAGE**

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## 0. INTRODUCTION

The term **script grammar** refers to the behaviour pattern of the writing system of a given language. Languages which have written representations do not use a haphazard manner of storing the information within the system, but use a coherent pattern which is similar to the linguistic grammar of a given language. With the help of specialists (not necessarily linguist) who work in the area of the written representation of the language, the manner in which the shapes of the characters of the language and the representation of the conjunct forms is provided. In other words the Script Grammar deals with the surface structure of the language and tries to provide the best possible “fit” for shapes and their representation. Since this is a highly subjective issue, the shapes provided here are recommendations at the best and conform to the perception of the mandating body/evaluators who consensually arrive at the “best possible fit” which is acceptable to a majority of users. An example from the Devanāgarī script will make the above clear. Although Marathi and Nepali share the same script Devanāgarī, not only do they not share the same character inventory but in addition the representation of certain characters is different. Thus the Nepali /la/ is different from the Marathi /la/ in so far as the placement of the stem is concerned Nepali ल Marathi ल. This ensures that the Script Grammar conforms to the language in question and provides the character shapes acceptable to a given user community. It should be noted that this does not mean monotony. The Marathi and Nepali /la/ can have a variety of forms once the intrinsic structure of the character is determined.

Script Grammar is the term used to define:

- the writing system used to inscribe a given language
- the history of the script and language (wherever available)
- the syllabic structure of the writing system of the language
- the rule ordering of the characters within the syllable (akshar)
- description of the syllabic clusters
- collation order of the characters: lexical / dictionary sorting order

## 1. OBJECTIVES OF SCRIPT GRAMMAR

The Objectives of the script grammar for each language can be divided into two major parts:

### Societal:

- Provide a visual representation of shapes that are deemed to be in conformity with the perception of a given community
- Ensure thereby that this perception is safe-guarded
- Through wide-spread dissemination and creation of appropriate tools ensure that within the given linguistic community, all media tries to adopt the given shape.

### Technical:

- Classify the language in terms of its ISO and also whether it belongs to the Abjad, Akshar (Alphasyllabary) class.
- Provide an inventory of the characters pertinent to the language and classify the same in terms of their taxonomy.
- As a corollary determine whether the inventory is in conformity to the Syllable formalism as stipulated in ISCII'91 and subsequently adopted by Unicode.
- Since Brahmi is written from left to right, and since certain characters do not follow the linear L to R order, provide an inventory of displaced catenators i.e. characters such as Mātrā/kārs that concatenate to the Consonant
- Propose the best shape representation of the individual characters as well as of the ligatures used within a given script. As a corollary request the expert(s) to identify the largest possible strings of such ligatures.
- Finally provide the collation order pertinent to that script/language, which would be of great utility to high-end NLP as well as to CLDR's in the pertinent language. The collation order for Nepali is different from Hindi although both languages share the same script. Thus in Nepali क्ष, ज्ञ are placed at the end of the consonant inventory i.e. after ह in the sort order. In Hindi क्ष is sorted along with क and ज्ञ with ज

## **2. END USERS FOR SCRIPT GRAMMAR**

The script-grammar specific to a given language can be used by a large number of users.

- Most importantly it can be used by font developers desirous of developing a font which is compliant with the perception of the characters and ligatures of a language by its user community.
- Certain features of the script grammar such as the shapes can also be used for testing OCR and OHWR. Similarly information regarding Ligatures as well as collation order can help in high-end NLP work such as detecting invalid combinations, correct implementation of syllable structure, prediction routines to name a few. Information regarding collation and character sets can be also used for CLDR.
- They allow the font designer to design a font which is in compliance with the norms and standards of that particular script. A major problem which will be dealt with in the template is one of ligatures. The final list of ligatures defined by the script grammar allows the font designer to write specific rules for such glyphs.
- It permits the software developer to design and implement the keyboard and the input mechanism which will meet the requirement of the particular linguistic community.
- The collation or sort order as described in a Script Grammar permits the software developer to write software functions/ routines for sorting data in all applications.
- Script Grammars are equally important for keyboard design, especially when supplemented by frequency data from a corpus.

As can be seen the script grammar has a wide range of use and can be of utility to font developers, Indian language developers and linguists in the area of computation.

### **3. SCOPE**

This script grammar document contains following information about the language and the script used for writing the language.

1. Name of the language and its representation in the 3 letter mnemonic as per ISO 639.1 & 639.3 standard.
2. Script used to inscribe the given language
3. The structure of the script used for writing the language
  - Rule ordering of the characters within the syllable formation is a language
  - Description of the syllabic clusters of the script
  - Collation order of the characters: lexical / dictionary sorting order
  - Compliance of the script with Unicode.

These will be treated within the relevant sections of the script grammar

## 4. TERMINOLOGY<sup>1</sup>

**Abjad:** A writing system in which each symbol always or usually stands for a consonant. The long vowels are indicated. However the short vowels are rarely marked and the reader needs to supply these. Example: Urdu written in Perso-Arabic Script is an example of this writing system.

**Abugida:** also called an alphasyllabary, is a segmental writing system in which consonant–vowel sequences are written as a unit: each unit is based on a consonant letter, and vowel notation is obligatory but secondary<sup>2</sup>

**Akshar:** see **Abugida**

**Allographs:** Variants of the representation of a character. Thus ae and æ [U+00E6] in Latin alphabet are allographs.

**Allo-Script:** The term relates to languages which share a common script. Thus Devanāgarī is used to write 9 official languages. However these languages do not use the same set of characters. Thus Marathi uses the retroflex lla ḷ [U+ 0933] which Hindi does not use. Flaps used in Hindi ᜈ [U+095C] ᜉ [U+095D] are not used in Konkani. These sub-sets of scripts based on a single “matricial” script are termed as allo-scripts.

**Alphabet:** A set of letters used in writing a language. Example: The English Alphabet.

**Aspirated consonant:** A consonant which is pronounced with an extra puff of air coming out at the time of release of the oral obstruction. This has a sound of an extra "h".

**Basic alphabet:** The minimal set of letters which can be used for uniquely encoding every word of a language. The basic alphabet for English consists of only the upper-case letters A-Z

**Catenators:** Also termed as Concatenators are characters which are concatenated to another character. In the Brahmi script these are the Mātrās or Vowel modifiers which are adjoined to the consonant and add a vocalic value to the consonant.

**Conjunct:** The Indic scripts are noted for a large number of consonant conjunct forms that serve as orthographic abbreviations (ligatures) of two or more adjacent letterforms. This abbreviation takes place only in the context of a consonant cluster....Under normal

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<sup>1</sup> As in the case of the BIS Document, in order to make the terminology accessible for all readers, examples have been chosen from English/Latin scripts, wherever possible. Some definitions have been excerpted from the BIS ISCII91 document and suitably modified where necessary.

<sup>2</sup> Wikipedia definition

circumstances, a consonant cluster is depicted with a conjunct glyph if such a glyph is available in the current font. In the absence of a conjunct glyph, the one or more dead consonants that form part of the cluster are depicted using half-form glyphs. In the absence of half-form glyphs, the dead consonants are depicted using the nominal consonant forms combined with visible virama signs.<sup>3</sup>

**Consonant:** A letter representing a speech sound in which the breath is at least partly obstructed,

**Diacritic:** A mark added to a letter which distinguishes it from the same letter without a mark, usually having a different phonetic value or stress.

**Displaced Catenator:** (see Catenator) Within the Brahmi script, the writing system is linear and moves from left to right. However in the case of some catenators this rule is not observed and the catenator (wholly or partially) is placed to the right of the consonant to which it relates. The short vowel I /fɔ/ in Devanāgarī is an example of a displaced catenator.

**Display composing:** The process of organizing the basic shapes available in a font in order to display (or print) a word.

**Display rendition:** The process by which a string of characters is displayed (or printed). In this process several consecutive characters may combine with each other on the screen. The sequence of display of the characters may become different.

**Eyebrow repha:** (See Eyelash ra)

**Eyelash ra:** The eyelash ra is used in Konkani, Nepali and Marathi. It is treated as different from the ؤ (repha) by certain linguists. While the former is treated as a flap, the latter is a continuant trill (cf., Kalyan Kale and Anjali Soman. 1986).

**Font:** A set of symbols used for display or printing of a script in a particular style.

**International numerals:** The conventional 0 to 9 digits used in English for denoting numbers. These are also known as Indo-Arabic numerals (to differentiate them from the Roman numerals like IX for 9).

**Latin alphabet:** The alphabet used for writing the language of ancient Rome. Also known as the Roman alphabet. The alphabet is used today for writing English and European languages.

**Letter:** A character representing one or more of the simple or compound sounds used in speech. It can be any of the alphabetic symbols.

**Ligature:** (see Conjunct)

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<sup>3</sup> Unicode ver. 6.0 Chapter 9.0 pp 6-7

**Nasal consonant:** A consonant pronounced with the breath passing through the nose.  
Example *m n* in English.

**Nasalized vowel:** A vowel pronounced with the breath passing both through the nose and the mouth. In Indian scripts this is denoted by a Chandrabindu and gives the vowel/vowel modifier over which it placed a nasal value. Example: जँच

**Phonetic alphabet:** An alphabet which has direct correspondence between letters and sounds  
Example: The International Phonetic Alphabet..

**Pure consonant:** A consonant which does not have any vowel implicitly associated with it.

**Rafar:** A special case of a ligature constituted by the adjunction of ra followed by a halanta to consonant. The resultant combination places the ra on top of the consonant to which it is adjoined. In case the consonant itself is adjoined to another consonant, the rafar is placed above the consonant e.g. रु+क कं , रु+घ्+य घ्यं

**Rakar:** A special case of a ligature constituted by the adjunction of a consonant followed by a halanta to ra. In a large number of Brahmi scripts the ra is adjoined to the stem of consonant to which it relates. In the case of consonants which have no stem such as the dental retroflexes in Devanāgarī, the rakar is placed below the consonant to which it relates.

**Repha:** (see **Rafar**)

**Roman script:** The script based on the ancient Roman alphabet, with the letters A-Z and additional diacritic marks. Used for writing a language which is not usually written in the Roman alphabet.

**Script:** A distinctive and complete set of characters used for the written form of one or more languages.

**Script numerals:** The 0 to 9 digits in a script, which have shapes distinct from their international counterparts.

**Syllable:** A unit of pronunciation uttered without interruption, forming whole or part of a word, and usually having one vowel or diphthong sound optionally surrounded by one or more consonants

**Transliteration:** Representation of words with the closest corresponding letters in an alphabet of a different language.

**Vowel:** A letter representing a speech sound made with the vibration of the vocal cords, but without audible obstruction

**Vowel sign:** A graphic character associated with a letter, to indicate a vowel to be associated with that character (Mātrā in Hindi).

## 5. PHILOSOPHY AND UNDERLYING PRINCIPLES

The script grammar is based on the following principles:

1. The Grammar aims to depict the surface grammar of the written language: the manner in which characters as well as conjuncts are depicted
2. Where a given script admits many languages, it is pre-suppose that such languages will prescribe different representations for a given shape or conjunct according to the perception of the native users of that language
3. Corollary to the above the result is a script and allo-scripts i.e. a given script shared by many languages is not uniformly deployed across all the languages but is subject to variations and modulations.
4. The term Grammar is used here in a non-normative sense: what is prescribed is in the form of recommendations provided by experts who visualize the shape of the given script in their mother tongue in a specific manner. Subjective variations may occur<sup>4</sup>
5. The Grammar is limited to its synchronic use i.e. the manner in which a given language as of today admits a character set within the script used to write it. It is not diachronic or historical in nature and does not study the evolution of the given script across centuries.

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<sup>4</sup> It is recommended that such variations be culled by placing the Grammars of different scripts in public review.

## **6. SCRIPT GRAMMAR STRUCTURE**

The script grammar provided below has the following parts.

Part 6.1. deals with peripheral elements such as the ISO of the language, the writing system used: (Alphasyllabic) Abugida or Abjad.

Part 6.2. treats of the syllabic structure. It verifies whether the character set of the language complies with the ISCII syllabic structure and if not which cases are not compliant.

Part 6.3 is the script grammar proper and describes the character set as well as the conjunct shapes of the given script along with the collation order

## **6.1. PERIPHERAL ELEMENTS OF THE SCRIPT GRAMMAR**

These constitute the elements that are peripheral to the Script Grammar. The main parameters considered are the mnemonic and name of the language (needed for CLDR and also for language tags), the writing system used to inscribe the language and wherever possible a short history of the language.

### **6.1.1. Name of the language and its representation in the 3 letter mnemonic as per ISO 639.1. & 639.3**

**Name of the Language: ASSAMESE**

**ISO Mnemonics: *asm***

This refers to a one line description of the language and its mnemonic representation as per the ISO.

### **6.1.2. Identification of the writing system(s) used to inscribe the given language Assamese is written using the Bengali script. It is an alphasyllabary with the akshar as its core.**

This is a one line description of the script used to write the language. However in case the language uses more than one script, all the scripts in question are specified, provided these constitute the official language of the given state.

All scripts derived from Brahmi are Abugidas i.e. syllabary driven systems. The main features of Abugidas are as under:

- The consonant has an implicit vowel built-in which is normally the schwa.
- The inherent vowel can be modified by the addition of other vowels or muted by a diacritic termed as a Virama or Halanta
- Vowels can be handled as full vowels with a vocalic value
- When two or more consonants join together they form ligatures which can be recognized by their shape ক্ষ or alternatively form an entirely new shape

ক + ষ = ক্ষ.

Abugidas/Alphasyllabaries because of their syllabic structure require a special description which is the subject of the discussion in 6.2. below.

### 6.1.3. Amendments needed in Unicode for Assamese language

Character	Name of the Character	Remark
অং	Urdha Bindu	Specially used to signify Doctor of Philosophy (occurs only with বং )
ং		Consonant
ৰ	1 Bigha	Local measurement of land (1 Bigha = 14440 sq.ft.)
৪	4 Katha	Local measurement of land (1 Katha = 1/5 <sup>th</sup> of 1 Bigha)
৩	3 Katha	Local measurement of land (1 Katha = 1/5 <sup>th</sup> of 1 Bigha)
২	2 Katha	Local measurement of land (1 Katha = 1/5 <sup>th</sup> of 1 Bigha)
১	1 Katha	Local measurement of land (1 Katha = 1/5 <sup>th</sup> of 1 Bigha)
৫	Lessa	Local measurement of land (1 Lessa = 1/20 <sup>th</sup> of 1 Katha)
।	1 Powa	Local measurement of land. (1 Powa = 1/4 <sup>th</sup> of 1 Lessa)

.	2 Powa	Local measurement of land. (1 Powa = 1/4 <sup>th</sup> of 1 Lessa)
.	3 Powa	Local measurement of land. (1 Powa = 1/4 <sup>th</sup> of 1 Lessa)

## 6.2. CONFORMITY TO THE SYLLABLE STRUCTURE

Assamese language complies with the syllable (akshar) structure described above. It can admit up to 4 consonant clusters.

Alphasyllabaries are determined by the notion of the syllable or the Akshar. The compositional grammar of the syllable determines its well-formedness. This is through a series of formal constraints based on a Backus-Naur Formalism which is given below. The syllable (akshar), first defined in the ISCII document (1991), identifies the following character ‘sub-sets’ for the purposes of identifying the syllable (akshar). In what follows the syllable analysis will be restricted to Assamese.

### (C) Consonants

ক	খ	গ	ঘ	ঙ
চ	ছ	জ	ঝ	ঞ
ট	ঠ	ড	ঢ	ণ
ত	থ	দ	ধ	ন
প	ফ	ব	ভ	ম
য	ৱ	ল	ৰ	শ
ষ	স	হ	ঙ্গ <sup>5</sup>	ঢ়
ঢ	ঝ	ঁ		

### (V) Vowels

অ	আ	ই	ঈ	উ	উ	ঁ	ঁ	এ	ঁ	ও	ও
---	---	---	---	---	---	---	---	---	---	---	---

### (M) Mātrās/Kārs or Vowel Modifiers

ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ	ঁ
---	---	---	---	---	---	---	---	---	---	---	---

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<sup>5</sup> ঙ্গ is a ligature but in Assamese it is deemed as one consonant and considered to be a part of the consonant set.

## (D) Diacritics

ଓঁ: Anuswar	Anuswara, a nasal, is denoted by a dot above the letter after which it is to be pronounced. This falls under Nasal category.
ঁ: Chandrabindu	Chandrabindu, a nasal, is denoted by a breve with a dot superposed above the letter after which it is to be pronounced. This falls under Nasal category.
ঁঁ: Visarga	Visarga, denoted by two dots placed above the other.
ঁঁঁ: Urdhabindu	To represent Ph.D. degree in Assamese as in বঁ

(H): Halanta/Hasanta ঁ - Halanta/Hasanta used in most writing systems to signify the lack of an inherent vowel.

(N)<sup>6</sup> Nukta ঁ - is used in Assamese (in ঃ, ঄ and অ)

Each of these sub-types has its restrictions in terms of what can precede or follow it, within a syllable (akshar), as shown in the table below:

PRECEDED BY	SUBTYPE	FOLLOWED BY
-, H	C	N,M,D,H
C	N	C,M,D,H
-	V	D
C, N	M	D
C, N,V,M	D	-
C, N	H	C
	Chandrabindu	Anuswar/Visarga

C can be preceded by H or no subtype and followed by any one of the following: M,D,H  
N can be preceded by C and followed by any one of the following: N,M,D,H

V can be preceded by no subtype and followed by D but not by another sub-type.

M can be preceded by C and followed by D.

D can be preceded by C, V, M and followed by no other subtype. It closes the syllable (akshar).

H can be preceded by C alone and followed only by C and no other sub-set.

### 6.2.1.Syllable (akshar) Types

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<sup>6</sup> The nukta is a small dot placed under a character in Northern scripts to show that they are flapped or for deriving 5 other consonants in the Devanāgarī and Punjabi scripts, required for Urdu ک,خ,گ,ج,ف

The formalism defines the syllable (akshar) in terms of both what can constitute a syllable (akshar) and what cannot. A valid syllable (akshar) as per this definition can be of only two types:

1. A vowel syllable (akshar): a full vowel.
2. A consonant syllable (akshar): a full consonant (having a weak vowel or a mātrā/kār)

The four other subsets viz. Mātrā/Kārs, Vowel Modifiers, Halanta/Hasanta and Nukta cannot constitute a syllable (akshar) by themselves or in combination among themselves.

1. The Vowel syllable (akshar) is of the following types:

- 1.1. A pure vowel all by itself: অ, /a/ আঁ /ā/ etc.
- 1.2. A vowel followed by a modifier i.e. either a nasal marker (*anunasika* or *anuswara*) or a visarga: ইঁ /i/, আঃ /āH/

2. The Consonant syllable (akshar) can be of the following types:

- 2.1. A full consonant (with or without Nukta) i.e. with the inherent vowel : ক /ka/
- 2.2. A consonant<sup>7</sup> (with or without Nukta) followed by a mātrā/kār i.e. the inherent vowel being substituted by another vowel: কি /ki/, পি /pi/
- 2.3. A consonant (with or without Nukta) followed by a modifier: কঁ /kɛ/, হঁ /haH<sup>8</sup>/
- 2.4. A consonant (with or without Nukta) followed by a mātrā/kār and a modifier: কুঁ /kū/, দুঁ /duH/.
- 2.5. A consonant cluster i.e. a dead or half consonant (Consonant+Halanta) followed by a full consonant followed optionally by a mātrā/kār, a modifier or a combination of both. These result in a ligature or what is often termed as *yuktakshara*<sup>9</sup>.

ক্তা /kta/, ক্তাঁ /ktā/, ন্তাৰ /ntaH/ ক্তুঁ /ktū/, ন্দু /ndu/

The above permutations and combinations result in 7 major syllable (akshar) types. Of these the last type introduces the problem of the number of consonant clusters. ISCII (91, p.23) provides for up to three consonant clusters as the “worst case” i.e. the largest possible string. This is functional for modern prakrits where the largest consonantal cluster rarely exceeds three consonant. However Assamese admits 4 Consonant clusters.

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This means that theoretically the following forms can be postulated:

1. Vowel Set: With the Vowel as the node.

V      VD

<sup>7</sup> For purposes of Simplification, C here will automatically be treated as being also consonant+nukta C+ N

<sup>8</sup> This character represents phonetically the weak implicit vowel, termed as schwa and often shown as /a/ also.

<sup>9</sup> The following theoretical consonant clusters are proposed

<sup>10</sup> Sanskrit admits a single case where fiveconsonants can come together: কার্ত্সন্য /kārtsnya/ "wholeness", "entirety" (secondary derivative from the adjective কৃত্সন্ন /kr̥tsna/ meaning "whole, complete".)

2. Consonant set: With the Consonant as the node (an implicit or modified vowel is pre-implied).

<b>Node</b>	<b>Mātrā/Kār</b>	<b>Modifier</b>	<b>Mātrā/Kār+Modifier</b>
C <sup>11</sup>	CM	CD	CMD
CHC	CHCM	CHCD	CHCMD
CHCHC	CHCHCM	CHCHCD	CHCHCMD
CHCHCHC	CHCHCHCM	CHCHCHCD	CHCHCHCM

An exception in Assamese to the consonant set is the *khanda ta* which cannot be followed by a Mātrā/Kār, Hasanta or a Diacritic. Given this exception, a total number of 16 theoretical syllables is therefore possible. It will be seen that the written syllable (akshar) is not very different in structure from the phonetic syllable and that the movement from the written to the spoken levels is made feasible by application of certain rules.

Since the formal structure script grammar of the syllable (akshar) is common to all Brahmi based scripts, it will not be treated in the sample template, but it will form the basis of an exhaustive description of the characters as well as their ligatural representations

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<sup>11</sup> “C” here will automatically be treated as being also consonant+nukta, C+N to simplify the explanation

## 6.3 SCRIPT GRAMMAR PROPER

This section lays down in detail the different parameters of the Script Grammar for Assamese. These are:

- 6.3.1. The Character Set of Assamese.
- 6.3.2. The Consonant mātrā/kār combinations of Assamese.
- 6.3.3. The Ligature Set of Assamese.
- 6.3.4. Collation Order of Assamese

### 6.3.1. The Character Set of Assamese

This section provides detailed information about the characters in the language and the list of the same and also more importantly shows the manner in which the character is to be written. Each subsection comprises therefore two parts: the basic character set and the shape each character should have, as mandated by the experts who have designed the script grammar of Assamese.

This comprises the following:

- 6.3.1.1. The Consonant Set
- 6.3.1.2. The Vowel Set
- 6.3.1.3. The Mātrā/Kār Set
- 6.3.1.4. Displaced Catenators
- 6.3.1.5. Shape of the combination of ra (rakar, repha)
- 6.3.1.6. The Set of Diacritics
- 6.3.1.7. Numerals
- 6.3.1.8. Punctuation marks
- 6.3.1.9. Other symbols

Each of these will be analysed in detail:

#### 6.3.1.1. The Consonant Set

The Consonant set of Assamese comprises the following characters:

A basic Consonant inventory arranged as per their Vargas.

	-voiced -aspirated	-voiced +aspirated	+voiced -aspirated	+voiced +aspirated	Nasal
Velar	କ	ଖ	ଗ	ଘ	ଘ
Palatal	ଚ	ଛ	ଜ	ଝ	ଝ
Retroflex	ଡ	ଠ	ଡ	ଢ	ଣ
Dental	ତ	ଥ	ଦ	ଧ	ନ

B-labial	ପ	ଫ	ବ	ଭ	ମ
----------	---	---	---	---	---

Flaps

ଡ	ଡ଼
---	----

Other consonants

ଘ	ର	ଳ	ର୍ଲ	ଶ
ଘ	ସ	ହ	କ୍ଷ	ଯ

Special consonant

୧୨ <sup>12</sup>
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The exact shapes as desired by the experts are provided in the table below:

	-voiced -aspirated	-voiced +aspirated	+voiced -aspirated	+voiced +aspirated	Nasal
Velar	କ	ଖ	ଗ	ଘ	ଙ୍ଗ
Palatal	ଚ	ଛ	ଜ	ଝ	ଞ୍ଜ
Retroflex	ଟି	ଠି	ଡ	ଢ	ଣ୍ଡ
Dental	ତ	ଥ	ଦ	ଧ	ନ୍ଧ
B-labial	ପ	ଫ	ବ	ଭ	ମ

Flaps

ଡ	ଡ଼
---	----

Other consonants

ଘ	ର	ଳ	ର୍ଲ	ଶ
---	---	---	-----	---

<sup>12</sup> the *khanda ta* is a special consonant in Assamese since unlike other consonants it cannot be followed by a Mātrā/Kār, Hasanta or a Diacritic but it can form a typical conjunct like ଙ୍ଗ (ଙ୍ଗ + ୱ). In Assamese

*Khanda ta* is considered as an allograph of ଟ. Examples of other allographs in Assamese are *rakar* and *reph* (allographs of ର୍କ), *J* *jakar* (allograph of ଙ୍ଗ) and *anuswara* ଋ (allograph of ୱ).

ষ	স	হ	ক্ষ	য
---	---	---	-----	---

Special consonant

ং
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### 6.3.1.2. The Vowel Set

The Vowel set of Assamese is as under:

অ	BENGALI LETTER A
আ	BENGALI LETTER AA
ই	BENGALI LETTER I
ঈ	BENGALI LETTER II
উ	BENGALI LETTER U
উ	BENGALI LETTER UU
ঞ	BENGALI LETTER VOCALIC R
এ	BENGALI LETTER E
ঐ	BENGALI LETTER AI
ও	BENGALI LETTER O
ঔ	BENGALI LETTER AU

As per expert recommendations the character set should be written as under:

অ      আ      ই      ঈ      উ      উ      ঞ      এ      ঐ      ও      ঔ

### 6.3.1.3. The Mātrā/Kār Set

The Mātrā/Kār (Vowel Modifier Set) of Assamese is as under:

Mātrā/Kār Names	Mātrā/kārs Sign	Where is it used ?	Consonant Shapes formed
1. Bengali sign AA	া	আ	ক + আ = কা
2. Bengali sign I ( stands to the left of the consonant)	ি	ই	ক + ই = কি
3. Bengali sign II	ী	ঈ	ক + ঈ = কী
4. Bengali sign U	ু	উ	ক + উ = কু
5. Bengali sign UU	ং	ঊ	ক + ঊ = কূ
6. Bengali sign vocalic R	ঁ	ঞ	ক + ঞ = কঁ
7. Bengali sign E	ই	এ	ক + এ = কে
8. Bengali sign AI	ঈ	ঐ	ক + ঐ = কৈ
9. Bengali sign O	ঋ	ও	ক + ও = কো
10. Bengali sign AU	ঋঁ	ঔ	ক + ঔ = কৌ

As per expert recommendations the character set should be written as under:

ং া ি ঀ ঁ ঁ ঁ ঁ ঁ ঁ ঁ

### 6.3.1.4. Displaced Catenators

Under normal circumstances Vowel Modifiers also known as catenators (since they concatenate to the preceding consonant) in Brahmi based scripts are written from left to right in linear order (with the exception of Consonant stacks). However certain modifiers are displaced and are placed to the left of the consonant to which they concatenate. Assamese admits the following displaced catenators.

CATENATOR	POSITION	EXAMPLE
ি	To left of Consonant	কি

ଠେ	To left of Consonant	କେ
ଠୈ	To left of Consonant	କୈ

## TWO PART DEPENDENT VOWEL SIGNS

ଠୋ	To right and left of the consonant	କୋ
ଠୌ	To right and left of the consonant	କୌ

### 6.3.1.5. Shape of the combination of ra (rakar, rafar/repha/reph)

The ର takes a variety of shapes known as rakar and rafar/repha/reph depending on its position. When conjoined before a consonant by means of the halanta/hasanta, it changes shape and is placed on top of the consonant or consonant clusters to which it relates. This is called a repha/reph or rafar. When it is conjoined after a consonant with the help of a halanta/hasanta, it appends to the consonant in the shape of a slanting stroke attached to the stem (side rakar) or in the case of consonants which have no stem such as ଟ, it is appended in the shape of a ^ to the bottom of the character (bottom rakar/ra phalā). Assamese has the following combinations of ra:

#### RAFAR/ REPHA/ REPH

କ୍ର      ତ

for eg. rep will be formed in case of following words.

ধର୍ମ, କର୍ତ୍ତବ୍ୟ, ଅର୍ଜନ

In addition to the rep being adjoined to the Consonant, Assamese like Sanskrit admits a special case of the rep being adjoined to the Vocalic RA as shown below. This is only in the case of a tatsama word (from Sanskrit): ନୈଖତ

The rep can also be adjoined as mentioned above to the *khanda ta* as in ଭ୍ରମ୍ଣା

#### RAKARS

1. Bottom rakar    ର୍ହ
2. Side rakar      ର୍ହ

Examples of words using rakar in Assamese language are given below:

ବର୍ଗ, ବାଞ୍ଚି, ପୁଅ

### 6.3.1.6. Diacritics

These are as under in the case of Assamese:

ং - Anuswar অংশ

ঁ - Chandrabindu/Anunasika পাঁচ

ঃ - Halanta/Hasanta উদ্বাটন

ঃ - Visarga দ্রুখ

ঁ - Urdhabindu to represent Ph.D. degree in Assamese as in ড°

### 6.3.1.7. Numerals

Following are the numbers used in Assamese language.

There is no fixed policy for use of Numbers. Both Latino-Arabic set: (0,1,2,3,4,5,6,7,8,9) and Assamese numerals are used in official documents as well as in day to day use.

১ ২ ৩ ৪ ৫ ৬ ৭ ৮ ৯ ০

Numeral Shapes	Explanation
০	Bengali Digit Zero
১	Bengali Digit One
২	Bengali Digit Two
৩	Bengali Digit Three
৪	Bengali Digit Four
৫	Bengali Digit Five
৬	Bengali Digit Six
৭	Bengali Digit Seven
৮	Bengali Digit Eight

৯	Bengali Digit Nine
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### 6.3.1.8. Punctuation Markers

Assamese uses punctuation markers from the Latin set. such as . , ; “ ‘ ( ) [ ] etc. Purna and Deergha Virama (full-stop/danda/danri) Devanagari code block: U+0964, U+0965 |, ||. | is used to mark the full stop and || is used for writing poetry of middle Assamese.

A list of punctuations is provided below:

Sr. No.	Name of the marker	Marker Shape
1.	Question Mark	?
2.	Exclamation Mark	!
3.	Comma	,
4.	Apostrophe	'
5.	Semi Colon	;
6.	Colon	:
7.	Hyphen	-
8.	Dash	--
9.	Ellipsis mark	...
10.	Oblique	/
11.	Double quotation mark	" "
12.	Single quotation mark	‘ ’
13.	Cross	XXX
14.	As Above	--" --
15.	Round Brackets	( )
16.	Square Brackets	[ ]
17.	Curly Brackets	{ }
18.	Abbreviation Sign	(.)/(°)
19.	Bengali Danda/Danri	
20.	Bengali Double Danda/Double Danri	

### 6.3.1.9 Other Symbols

These are religious, currency markers etc. included in Unicode:

₹: Rupee Sign as mandated by Government of India

### 6.3.2. Consonant Mātrā/Kār Combinations.

These refer to the shapes generated when a Mātrā/Kār is adjoined to the Consonant. The layout of these is in the shape of a matrix where the first horizontal row refers to the active consonant and the first vertical column refers to the vowel-modifier.

Due to constraints of space and also for reasons of clarity, for each class a series of 3 tables are provided.

Table 1: ক খ গ ঘ ঙ চ ছ জ ঝ এ

Table 2: ট ঠ ড ঢ ণ ত থ দ ধ ন

Table 3: প ফ ব ভ ম য র ল র শ

ঘ স হ ঙ্ঘ ড় ঢ় য়

Wherever there is an X it implies that the combination does not exist. For the font developer this is an indication that for this particular combination which is not possible in the language but needs to be accommodated in the font table, a simple linear combination be provided.

e.g. Although the combination of ঙ + Mātrā/Kār is used only in few cases, it needs to be handled at the font level in the anticipation that a user could type this combination.

Although normally the combination of ঙ + এ is not acceptable in the language, to ensure that such a combination if entered by the user, should be displayed as: ঙ

The classes are as under:

6.3.2.1. refers to a simple concatenation of Consonant and Mātrā/Kār combinations.

6.3.2.2. refers to a concatenation of Consonant and Mātrā/Kār + Nasal marker combinations. Other diacritics such as avagraha and visarga have been avoided, since these are linear in nature, are adjoined to the combination and do not in any way modify the structure of the shapes.

### 6.3.2.1 Consonant and Mātrā/Kār combinations.

This set refers to a simple concatenation of Consonant and Mātrā/Kār.

#### Consonant and Mātrā/Kār combinations Set 1

	ক	খ	গ	ঘ	ঙ	চ	ছ	জ	ঝ	ঞ
া	কা	খা	গা	ঘা	ঙা	চা	ছা	জা	ঝা	ঞা
ি	কি	খি	গি	ঘি	ঙি	চি	ছি	জি	ঝি	ঞি
ী	কী	খী	গী	ঘী	ঙী	চী	ছী	জী	ঝী	ঞী
ু	কু	খু	গু	ঘু	ঙু	চু	ছু	জু	ঝু	ঞু
ূ	কূ	খূ	গূ	ঘূ	ঙূ	চূ	ছূ	জূ	ঝূ	ঞূ
্ৰ	ক্ৰ	খ্ৰ	গ্ৰ	ঘ্ৰ	ঙ্ৰ	চ্ৰ	ছ্ৰ	জ্ৰ	ঝ্ৰ	ঞ্ৰ
ে	কে	খে	গে	ঘে	ঙে	চে	ছে	জে	ঝে	ঞে
ৈ	কৈ	খৈ	গৈ	ঘৈ	ঙৈ	চৈ	ছৈ	জৈ	ঝৈ	ঞৈ
ো	কো	খো	গো	ঘো	ঙো	চো	ছো	জো	ঝো	ঞো
ঁো	কোঁ	খোঁ	গোঁ	ঘোঁ	ঙোঁ	চোঁ	ছোঁ	জোঁ	ঝোঁ	ঞোঁ

Remark 1- ঙ and ঞ are not used as the first members of clusters

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<sup>13</sup> Variant shape is 

## Consonant and Mātrā/Kār combinations Set 2

This set is in continuation of set 1 which shows consonant and Matra combinations.

	ট	ঠ	ড	ঢ	ণ	ত	থ	দ	ধ	ন
ঁ	ঁটা	ঁঠা	ঁডা	ঁঢা	ঁণা	ঁতা	ঁথা	ঁদা	ঁধা	ঁনা
ঃ	ঃটি	ঃঠি	ঃডি	ঃঢি	ঃণি	ঃতি	ঃথি	ঃদি	ঃধি	ঃনি
ঁী	ঁটী	ঁঠী	ঁডী	ঁঢী	ঁণী	ঁতী	ঁথী	ঁদী	ঁধী	ঁনী
ঁু	ঁটু	ঁঠু	ঁডু	ঁঢু	ঁণু	ঁতু	ঁথু	ঁদু	ঁধু	ঁনু
ঁূ	ঁটূ	ঁঠূ	ঁডূ	ঁঢূ	ঁণূ	ঁতূ	ঁথূ	ঁদূ	ঁধূ	ঁনূ
ঁৈ	ঁটৈ	ঁঠৈ	ঁডৈ	ঁঢৈ	ঁণৈ	ঁতৈ	ঁথৈ	ঁদৈ	ঁধৈ	ঁনৈ
ঁে	ঁটে	ঁঠে	ঁডে	ঁঢে	ঁণে	ঁতে	ঁথে	ঁদে	ঁধে	ঁনে
ঁৈ	ঁটৈ	ঁঠৈ	ঁডৈ	ঁঢৈ	ঁণৈ	ঁতৈ	ঁথৈ	ঁদৈ	ঁধৈ	ঁনৈ
ঁো	ঁটো	ঁঠো	ঁডো	ঁঢো	ঁণো	ঁতো	ঁথো	ঁদো	ঁধো	ঁনো
ঁৌ	ঁটৌ	ঁঠৌ	ঁডৌ	ঁঢৌ	ঁণৌ	ঁতৌ	ঁথৌ	ঁদৌ	ঁধৌ	ঁনৌ

### Consonant and Mātrā/Kār combinations Set 3

This set is in continuation of set 2 which shows consonant and Matra combinations.

	প	ফ	ব	ভ	ম	য	ৰ	ল	ৱ	শ	ষ	স	হ	ক্ষ	ড়	ঢ়	য	
ঠ	পা	ফা	বা	ভা	মা	যা	ৰা	লা	ৱা	শা	ষা	সা	হা	ক্ষা	ড়া	ঢ়া	যা	
ঃ	পি	ফি	বি	ভি	মি	যি	ৰি	লি	ৱি	শি	ষি	সি	হি	ক্ষি	ড়ি	ঢ়ি	যি	
ঁ	পী	ফী	বী	ভী	মী	যী	ৰী	লী	ৱী	শী	ষী	সী	হী	ক্ষী	ড়ী	ঢ়ী	যী	
ু	পু	ফু	বু	ভু	মু	যু	ৰু <sup>14</sup>	লু	ৱু	শু <sup>15</sup>	ষু	সু <sup>16</sup>	হু	ক্ষু	ডু	ঢু	যু	
ূ	পূ	ফূ	বূ	ভূ	মূ	যূ	ৰূ <sup>17</sup>	লূ	ৱূ	শূ	ষূ	সূ <sup>18</sup>	হূ	ক্ষূ	ডূ	ঢূ	যূ	
ঃ	পঃ	ফঃ	বঃ	ভঃ	মঃ	যঃ	ৰঃ	X	লঃ	ৱঃ	শঃ	ষঃ	সঃ <sup>19</sup>	হঃ	ক্ষঃ	X	X	X
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	
ঁ	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ক্ষঁ	ডঁ	ঢঁ	যঁ	

<sup>14</sup> Variant shape is 

<sup>15</sup> Variant shape is 

<sup>16</sup> Variant shape is 

<sup>17</sup> Variant shape is 

<sup>18</sup> Variant shape is 

<sup>19</sup> Variant shape is 

### 6.3.2.2 Consonant and Mātrā/Kār +Nasal combinations.

This set refers to a Consonant and Mātrā/Kār + Nasal marker combinations.

#### Consonant and Mātrā/Kār + Nasal combinations: With Anuswar - Set 1

	କ	ଖ	ଗ	ଘ	ଙ୍ଗ	ଚ	ଛ୍	ଜ	ଝ	ଞ୍ଜ
ଠେ	କେ	ଖେ	ଗେ	ଘେ	X	ଚେ	ଛେ	ଜେ	ଝେ	X
ଠାୟେ	କାୟେ	ଖାୟେ	ଗାୟେ	ଘାୟେ	X	ଚାୟେ	ଛାୟେ	ଜାୟେ	ଝାୟେ	X
ଠିୟେ	କିୟେ	ଖିୟେ	ଗିୟେ	ଘିୟେ	X	ଚିୟେ	ଛିୟେ	ଜିୟେ	ଝିୟେ	X
ଠୀୟେ	X	X	X	X	X	X	X	X	X	X
ଠୁୟେ	କୁୟେ	ଖୁୟେ	ଗୁୟେ <sup>20</sup>	ଘୁୟେ	X	ଚୁୟେ	ଛୁୟେ	ଜୁୟେ	ଝୁୟେ	X
ଠୂୟେ	କୁୟେ	ଖୁୟେ	ଗୁୟେ	ଘୁୟେ	X	ଚୁୟେ	ଛୁୟେ	ଜୁୟେ	ଝୁୟେ	X
ଠେୟେ	କେୟେ	ଖେୟେ	ଗେୟେ	ଘେୟେ	X	ଚେୟେ	ଛେୟେ	ଜେୟେ	ଝେୟେ	X
ଠୈୟେ	କୈୟେ	ଖୈୟେ	ଗୈୟେ	ଘୈୟେ	X	ଚୈୟେ	ଛୈୟେ	ଜୈୟେ	ଝୈୟେ	X
ଠୋୟେ	କୋୟେ	ଖୋୟେ	ଗୋୟେ	ଘୋୟେ	X	ଚୋୟେ	ଛୋୟେ	ଜୋୟେ	ଝୋୟେ	X
ଠୌୟେ	କୌୟେ	ଖୌୟେ	ଗୌୟେ	ଘୌୟେ	X	ଚୌୟେ	ଛୌୟେ	ଜୌୟେ	ଝୌୟେ	X

<sup>20</sup> Variant shape as per traditional orthography is



## Consonant and Mātrā/Kār + Nasal combinations: With Anuswar - Set 2

This set is in continuation of set 1 above which shows combinations of Consonant and Mātrā/Kār + Nasal marker

	ট	ঠ	ড	ঢ	ণ	ত	থ	দ	ধ	ন
ং	টং	ঠং	ডং	ঢং	ণং	তং	থং	দং	ধং	নং
ঠঠং	ঠোং	ঠাং	ডাং	ঢাং	ণাং	তাং	থাং	দাং	ধাং	নাং
ঃঠিং	ঠিং	ঠিং	ডিং	ঢিং	ণিং	তিং	থিং	দিং	ধিং	নিং
ঠীঠীং	ঠীং	ঠীং	ডীং	ঢীং	ণীং	তীং	থীং	দীং	ধীং	নীং
ঠুঠুং	ঠুং	ঠুং	ডুং	ঢুং	ণুং	তুং	থুং	দুং	ধুং	নুং
ঠুঠুং	ঠুং	ঠুং	ডুং	ঢুং	ণুং	তুং	থুং	দুং	ধুং	নুং
ঠুঠুং	ঠুং	ঠুং	ডুং	ঢুং	ণুং	তুং	থুং	দুং	ধুং	নুং
ঠেঠেং	ঠেং	ঠেং	ডেং	ঢেং	ণেং	তেং	থেং	দেং	ধেং	নেং
ঠেঠেং	ঠেং	ঠেং	ডেং	ঢেং	ণেং	তেং	থেং	দেং	ধেং	নেং
ঠোঠোং	ঠোং	ঠোং	ডোং	ঢোং	ণোং	তোং	থোং	দোং	ধোং	নোং
ঠোঠোং	ঠোং	ঠোং	ডোং	ঢোং	ণোং	তোং	থোং	দোং	ধোং	নোং

### Consonant and Mātrā/Kār + Nasal combinations: With Anuswar - Set 3

This set is in continuation of set 2 above which shows combinations of Consonant and Mātrā/Kār + Nasal marker

	প	ফ	ব	ভ	ম	য	ৰ	ল	ৱ	শ	ষ	স	হ	ক্ষ	ড়	ঢ়	য
০১	পং	ফং	বং	ভং	মং	যং	ৰং	লং	ৱং	শং	ষং	সং	হং	ক্ষং	ড়ং	ঢ়ং	যং
০২	পাং	ফাং	বাং	ভাং	মাং	যাং	ৰাং	লাং	ৱাং	শাং	ষাং	সাং	হাং	ক্ষাং	ড়াং	ঢ়াং	যাং
০৩	পিং	ফিং	বিং	ভিং	মিৎ	যিং	ৰিং	লিং	ৱিং	শিং	ষিং	সিং	হিং	ক্ষিং	ড়িং	ঢ়িং	যিং
০৪	পীং	ফীং	বীং	ভীং	মীং	যীং	ৰীং	লীং	ৱীং	শীং	ষীং	সীং	হীং	ক্ষীং	ড়ীং	ঢ়ীং	যীং
০৫	পুং	ফুং	বুং	ভুং	মুং	যুং	ৰুং <sup>21</sup>	লুং	ৱুং	শুং <sup>22</sup>	ষুং	সুং <sup>23</sup>	হুং	ক্ষুং	ড়ুং	ঢ়ুং	যুং
০৬	পৃং	ফৃং	বৃং	ভৃং	মৃং	যৃং	ৰৃং <sup>24</sup>	লৃং	ৱৃং	শৃং	ষৃং	সৃং <sup>25</sup>	হৃং	ক্ষৃং	ড়ৃং	ঢ়ৃং	যৃং
০৭	পং	ফং	বং	ভং	মং	যং	X	লং	ৱং	শং	ষং	সং <sup>26</sup>	হং	ক্ষং	X	X	X
০৮	পেং	ফেং	বেং	ভেং	মেং	যেং	ৰেং	লেং	ৱেং	শেং	ষেং	সেং	হেং	ক্ষেং	ডেং	ঢেং	যেং
০৯	পৈং	ফৈং	বৈং	ভৈং	মৈং	য়েং	ৰৈং	লৈং	ৱৈং	শৈং	ষৈং	সৈং	হৈং	ক্ষৈং	ডৈং	ঢৈং	যৈং
১০	পোং	ফোং	বোং	ভোং	মোং	যোং	ৰোং	লোং	ৱোং	শোং	ষোং	সোং	হোং	ক্ষোং	ডোং	ঢোং	যোং
১১	পৌং	ফৌং	বৌং	ভৌং	মৌং	যৌং	ৰৌং	লৌং	ৱৌং	শৌং	ষৌং	সৌং	হৌং	ক্ষৌং	ডৌং	ঢৌং	যৌং

<sup>21</sup> Variant shape is 

<sup>22</sup> Variant shape is 

<sup>23</sup> Variant shape is 

<sup>24</sup> Variant shape is 

<sup>25</sup> Variant shape is 

<sup>26</sup> Variant shape is 

## Consonant and Mātrā/Kār + Nasal combinations: With Chandrabindu - Set 1

	କ	ଖ	ଗ	ଘ	ଙ୍ଗ	ଚ	ହ	ଜ	ଝ	ଞ୍ଜ
ଠ	କଁ	ଖଁ	ଗଁ	ଘଁ	X	ଚଁ	ହଁ	ଜଁ	ଝଁ	X
ଠା	କାଁ	ଖାଁ	ଗାଁ	ଘାଁ	X	ଚାଁ	ହାଁ	ଜାଁ	ଝାଁ	X
ଠି	କିଁ	ଖିଁ	ଗିଁ	ଘିଁ	X	ଚିଁ	ହିଁ	ଜିଁ	ଝିଁ	X
ଠାି	କାିଁ	ଖାିଁ	ଗାିଁ	ଘାିଁ	X	ଚାିଁ	ହାିଁ	ଜାିଁ	ଝାିଁ	X
ଡ	କୁଁ	ଖୁଁ	ଗୁଁ <sup>27</sup>	ଘୁଁ	X	ଚୁଁ	ହୁଁ	ଜୁଁ	ଝୁଁ	X
ଡା	କାୟୁଁ	ଖାୟୁଁ	ଗାୟୁଁ	ଘାୟୁଁ	X	ଚାୟୁଁ	ହାୟୁଁ	ଜାୟୁଁ	ଝାୟୁଁ	X
ଡି	କୁୟୁଁ	ଖୁୟୁଁ	ଗୁୟୁଁ	ଘୁୟୁଁ	X	ଚାୟୁଁ	ହାୟୁଁ	ଜାୟୁଁ	ଝାୟୁଁ	X
ଡେ	କେଁ	ଖେଁ	ଗେଁ	ଘେଁ	X	ଚେଁ	ହେଁ	ଜେଁ	ଝେଁ	X
ଡୈ	କୈଁ	ଖୈଁ	ଗୈଁ	ଘୈଁ	X	ଚୈଁ	ହୈଁ	ଜୈଁ	ଝୈଁ	X
ଡୋ	କୋଁ	ଖୋଁ	ଗୋଁ	ଘୋଁ	X	ଚୋଁ	ହୋଁ	ଜୋଁ	ଝୋଁ	X
ଡୌ	କୋୟୁଁ	ଖୋୟୁଁ	ଗୋୟୁଁ	ଘୋୟୁଁ	X	ଚୋୟୁଁ	ହୋୟୁଁ	ଜୋୟୁଁ	ଝୋୟୁଁ	X

<sup>27</sup> Variant shape as per traditional orthography is



## Consonant and Mātrā/Kār +Nasal combinations: With Chandrabindu - Set 2

This set is in continuation of set 1 above which shows combinations of Consonant and Mātrā/Kār + Chandrabindu

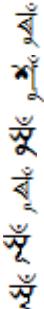
	ট	ঢ	ড	ঢ	ণ	ত	থ	দ	ধ	ন
ঁ	টঁ	ঢঁ	ডঁ	ঢঁ	X	তঁ	থঁ	দঁ	ধঁ	X
ঠঁ	টঁ	ঢঁ	ডঁ	ঢঁ	X	তাঁ	থাঁ	দাঁ	ধাঁ	X
ঃ	টিঁ	ঢিঁ	ডিঁ	ঢিঁ	X	তিঁ	থিঁ	দি�	ধিঁ	X
ঠীঁ	টীঁ	ঢীঁ	ডীঁ	ঢীঁ	X	তীঁ	থীঁ	দীঁ	ধীঁ	X
ং	টুঁ	ঢুঁ	ডুঁ	ঢুঁ	X	তুঁ	থুঁ	দুঁ	ধুঁ	X
ঠুঁ	টুঁ	ঢুঁ	ডুঁ	ঢুঁ	X	তুঁ	থুঁ	দুঁ	ধুঁ	X
ং	টুঁ	ঢুঁ	ডুঁ	ঢুঁ	X	তুঁ	থুঁ	দুঁ	ধুঁ	X
ঠুঁ	টুঁ	ঢুঁ	ডুঁ	ঢুঁ	X	তুঁ	থুঁ	দুঁ	ধুঁ	X
ঠেঁ	টেঁ	ঢেঁ	ডেঁ	ঢেঁ	X	তেঁ	থেঁ	দেঁ	ধেঁ	X
ঠৈঁ	টেঁ	ঢেঁ	ডেঁ	ঢেঁ	X	তেঁ	থেঁ	দেঁ	ধেঁ	X
ঠোঁ	টোঁ	ঢোঁ	ডোঁ	ঢোঁ	X	তোঁ	থোঁ	দোঁ	ধোঁ	X
ঠোঁ	টোঁ	ঢোঁ	ডোঁ	ঢোঁ	X	তোঁ	থোঁ	দোঁ	ধোঁ	X

## Consonant and Mātrā/Kār +Nasal combinations: With Chandrabindu - Set 3

This set is in continuation of set 2 above which shows combinations of Consonant and Mātrā/Kār + Chandrabindu

	প	ফ	ব	ভ	ম	য	ৰ	ল	ৱ	শ	ষ	স	হ	ঞ	ড	ঢ	য
ং	পঁ	ফঁ	বঁ	ভঁ	মঁ	যঁ	ৰঁ	লঁ	ৱঁ	শঁ	ষঁ	সঁ	হঁ	ঞঁ	ডঁ	ঢঁ	যঁ
ঠঁ	পাঁ	ফাঁ	বাঁ	ভাঁ	X	যাঁ	ৰাঁ	লাঁ	ৱাঁ	শাঁ	ষাঁ	সাঁ	হাঁ	ঞাঁ	ডাঁ	ঢাঁ	যাঁ
ঃ	পিঁ	ফিঁ	বিঁ	ভিঁ	X	যিঁ	ৰিঁ	লিঁ	ৱিঁ	শিঁ	ষিঁ	সিঁ	হিঁ	ঞিঁ	ডিঁ	ঢিঁ	যিঁ
ঃ	পীঁ	ফীঁ	বীঁ	ভীঁ	X	যীঁ	ৰীঁ	লীঁ	ৱীঁ	শীঁ	ষীঁ	সীঁ	হীঁ	ঞীঁ	ডীঁ	ঢীঁ	যীঁ
ঃ	পুঁ	ফুঁ	বুঁ	ভুঁ	মুঁ	X	যুঁ	ৰুঁ <sup>28</sup>	লুঁ	ৱুঁ	শুঁ <sup>29</sup>	সুঁ <sup>30</sup>	হুঁ	ঞুঁ	ডুঁ	ঢুঁ	যুঁ
ঃ	পুঁ	ফুঁ	বুঁ	ভুঁ	মুঁ	X	যুঁ	ৰুঁ <sup>31</sup>	লুঁ	ৱুঁ	শুঁ	সুঁ <sup>32</sup>	হুঁ	ঞুঁ	ডুঁ	ঢুঁ	যুঁ
ঃ	পঁ	ফঁ	বঁ	ভঁ	মঁ	X	যঁ	X	লঁ	ৱঁ	শঁ	সঁ	হঁ	ঞঁ	X	X	X
ঃ	পেঁ	ফেঁ	বেঁ	ভেঁ	X	যেঁ	ৰেঁ	লেঁ	ৱেঁ	শেঁ	ষেঁ	সেঁ	হেঁ	ক্ষেঁ	ডেঁ	ঢেঁ	যেঁ
ঃ	পৈঁ	ফৈঁ	বৈঁ	ভৈঁ	X	যৈঁ	ৰৈঁ	লৈঁ	ৱৈঁ	শৈঁ	ষৈঁ	সৈঁ	হৈঁ	ক্ষৈঁ	ডৈঁ	ঢৈঁ	যৈঁ
ঃ	পোঁ	ফোঁ	বোঁ	ভোঁ	X	যোঁ	ৰোঁ	লোঁ	ৱোঁ	শোঁ	ষোঁ	সোঁ	হোঁ	ক্ষোঁ	ডোঁ	ঢোঁ	যোঁ
ঃ	পৌঁ	ফৌঁ	বৌঁ	ভৌঁ	X	যৌঁ	ৰৌঁ	লৌঁ	ৱৌঁ	শৌঁ	ষৌঁ	সৌঁ	হৌঁ	ক্ষৌঁ	ডৌঁ	ঢৌঁ	যৌঁ

<sup>28</sup> Variant shape is



<sup>29</sup> Variant shape is

<sup>30</sup> Variant shape is

<sup>31</sup> Variant shape is

<sup>32</sup> Variant shape is

<sup>33</sup> Variant shape is

### 6.3.3. The Ligature Set of Assamese.

Assamese has a large set of ligatural forms. These are combinations of Consonant+Halanta+Consonant (CHC) or CHCHC or even rarer CHCHCHC. The CHC combinations which are the most frequent are arranged in the shape of a matrix: the abscissa or horizontal axis refers to the Consonant which constitutes the ligature and the ordinate or vertical axis shows the consonant which forms the ligature and which is followed by a halanta.

As in 6.3.2. the ligature sets are divided into the following

6.3.3.1 CHC (in a matrix)

6.3.3.2 CHCHC

6.3.3.3.CHCHCHC

#### 6.3.3.1. CHC ( combination of two consonants)

These ligatures are presented as in the earlier case of Consonant+Mātrā/Kār combinations in three sets. A lot of “slots” have an X marked, showing that the ligature is not possible in the language but is theoretically possible. In these cases, the font developer is to assume that the ligature is linear in nature.

The following set shows a combination of two consonants. To know how particular combinations forms, select one consonant from the first column and second from first row. For eg. Combination of consonant “ক” and “খ” is ligature “କ୍ଖ”.

CHC( combination of two consonants) - Set 1											
	ক	খ	গ	ঘ	ঙ	চ	ছ	জ	ঝ	ঞ	ঞ
ক	ক/ କ	কখ/ କଖ	কগ/ କଗ	কঘ/ କଘ	কঙ/ କଙ	কচ/ କଚ	কছ/ କଛ	কজ/ କଜ	କଝ/କଝ	କଞ/କଞ	କଞ/କଞ
খ	X	X	X	X	X	X	X	X	X	X	X
গ	ଗକ/ ଗକ	ଗଖ/ ଗଖ	ଗଗ/ଗଗ	ଗଘ/ଗଘ	ଗଙ/ଗଙ	ଗଚ/ଗଚ	ଗଛ/ଗଛ	ଗଜ/ଗଜ	ଗଝ/ଗଝ	ଗଞ/ଗଞ	ଗଞ/ଗଞ
ঘ	ঘক/ ଘକ	ঘখ/ ଘଖ	ঘগ/ଘଗ	ঘঘ/ଘଘ	ঘঙ/ଘଙ	ঘচ/ଘଚ	ঘছ/ଘଛ	ঘজ/ଘଜ	ঘঝ/ଘଝ	ঘଞ/ଘଞ	ঘଞ/ଘଞ

ঝ	ঝ/ 	ঝা	ঙ্গ	ঙ্ঘ	X	জ্চ/ 	জ্ছ/ 	জ্জে/ 	জ্বা/ 	X
চ	চক/ 	চখ/ 	চগ/ 	চঘ/ 	চঙ্গ/ 	চ	চ্ৰ/ 	চ্ৰজ/ 	চ্ৰবা/ 	চ্ৰও
হ	হক/ 	হখ/ 	হগ/ 	হঘ/ 	হঙ্গ/ 	X	হ্ৰ/ 	হ্ৰজ/ 	হ্ৰবা/ 	হ্ৰও
জ	জ্ক/ 	জ্খ/ 	জ্গ/ 	জ্ঘ/ 	জ্ঙ/ 	জ্চ/ 	জ্ছ/ 	জ্জে/ 	জ্বা/ 	জ্বও
ঝ	ঝক/ 	ঝখ/ 	ঝগ/ 	ঝঘ/ 	ঝঙ্গ/ 	ঝচ/ 	ঝছ/ 	ঝজে/ 	ঝবা/ 	ঝও
়	়েক/ 	়েখ/ 	়েগ/ 	়েঘ/ 	়েঙ্গ/ 	X	়ে়/	়ে়ে/	়ে়ে	X
ট	টক/ 	টখ/ 	টগ/ 	টঘ/ 	টঙ্গ/ 	টচ/ 	টছ/ 	টজ/ 	টবা/ 	টও
ঠ	ঠক/ 	ঠখ/ 	ঠগ/ 	ঠঘ/ 	ঠঙ্গ/ 	ঠচ/	ঠছ/	ঠজ/	ঠবা/	ঠও
ড	ডক/ 	ডখ/	ডগ/	ডঘ/	ডঙ্গ/	ডচ/	ডছ/	ডজ/	ডবা/	ডও

ତ	ତ୍କ/ ତୁ	ତ୍ଖ/ ତୁ	ତ୍ଗ/ ତୁ	ତ୍ଘ/ ତୁ	ତ୍ଶ/ ତୁ	ତ୍ଚ/ ତୁ	ତ୍ଛ/ ତୁ	ତ୍ଜ/ ତୁ	ତ୍ବା/ ତୁ	ତ୍ଣେ/ ତୁ
ଣ	ଣ୍କ/ ଣୁ	ଣ୍ଖ/ ଣୁ	ଣ୍ଗ/ ଣୁ	ଣ୍ଘ/ ଣୁ	X	ଣ	ଣ୍ଛ/ ଣୁ	ଣ୍ଜ/ ଣୁ	ଣ୍ବା/ ଣୁ	X
ତ୍ୟ	ତ୍ୟକ	ତ୍ୟଖ	ତ୍ୟଗ	ତ୍ୟଘ	ତ୍ୟଶ	ତ୍ୟଚ	ତ୍ୟଛ	ତ୍ୟଜ	ତ୍ୟବା	ତ୍ୟଣେ
ଥ	ଥ୍କ/ ଥୁ	ଥ୍ଖ/ ଥୁ	ଥ୍ଗ/ ଥୁ	ଥ୍ଘ/ ଥୁ	ଥ୍ଶ/ଥୁ	ଥ୍ଚ/ଥୁ	ଥ୍ଛ/ଥୁ	ଥ୍ଜ/ଥୁ	ଥ୍ବା/ଥୁ	ଥ୍ଣେ/ଥୁ
ଦ	ଦ୍ର୍କ/ ଦୁ	ଦ୍ର୍ଖ/ଦୁ	ଦ୍ର୍ଗ/ଦୁ	ଦ୍ର୍ଘ/ଦୁ	ଦ୍ର୍ଶ/ଦୁ	ଦ୍ର୍ଚ/ଦୁ	ଦ୍ର୍ଛ/ଦୁ	ଦ୍ର୍ଜ/ଦୁ	ଦ୍ର୍ବା/ଦୁ	ଦ୍ର୍ଣେ/ଦୁ
ଧ	ଧ୍ର୍କ/ଧୁ	ଧ୍ର୍ଖ/ଧୁ	ଧ୍ର୍ଗ/ଧୁ	ଧ୍ର୍ଘ/ଧୁ	ଧ୍ର୍ଶ/ଧୁ	ଧ୍ର୍ଚ/ଧୁ	ଧ୍ର୍ଛ/ଧୁ	ଧ୍ର୍ଜ/ଧୁ	ଧ୍ର୍ବା/ଧୁ	ଧ୍ର୍ଣେ/ଧୁ
ନ	ନ୍କ/ନୁ	ନ୍ଖ/ନୁ	ନ୍ଗ/ନୁ	ନ୍ଘ/ନୁ	X	ନ	ନ୍ଛ	ନ୍ଜ/ନୁ	ନ୍ବା/ନୁ	X
ପ	ପ୍ର୍କ/ପୁ	ପ୍ର୍ଖ/ପୁ	ପ୍ର୍ଗ/ପୁ	ପ୍ର୍ଘ/ପୁ	ପ୍ର୍ଶ/ପୁ	ପ୍ର୍ଚ/ପୁ	ପ୍ର୍ଛ/ପୁ	ପ୍ର୍ଜ/ପୁ	ପ୍ର୍ବା/ପୁ	ପ୍ର୍ଣେ/ପୁ
ଫ	ଫ୍ର୍କ/ଫୁ	ଫ୍ର୍ଖ/ଫୁ	ଫ୍ର୍ଗ/ଫୁ	ଫ୍ର୍ଘ/ଫୁ	ଫ୍ର୍ଶ/ଫୁ	ଫ୍ର୍ଚ/ଫୁ	ଫ୍ର୍ଛ/ଫୁ	ଫ୍ର୍ଜ/ଫୁ	ଫ୍ର୍ବା/ଫୁ	ଫ୍ର୍ଣେ/ଫୁ
ବ	ବ୍ର୍କ/ବୁ	ବ୍ର୍ଖ/ବୁ	ବ୍ର୍ଗ/ବୁ	ବ୍ର୍ଘ/ବୁ	ବ୍ର୍ଶ/ବୁ	ବ୍ର୍ଚ/ବୁ	ବ୍ର୍ଛ/ବୁ	ବ୍ର୍ଜ/ବୁ	ବ୍ର୍ବା/ବୁ	ବ୍ର୍ଣେ/ବୁ

ତ	ତ୍କ/ ତୁ	ତ୍ଥ/ ତୁ	ତ୍ଗ/ ତୁ	ତ୍ସ/ ତୁ	ତ୍ଶ/ ତୁ	ତ୍ଚ/ ତୁ	ତ୍ଛ/ ତୁ	ତ୍ଜ/ ତୁ	ତ୍ବ/ ତୁ	ତ୍ପ୍ର/ ତୁ
ମ	ମ୍କ/ ମୁ	ମ୍ଥ/ ମୁ	ମ୍ଗ/ ମୁ	ମ୍ସ/ ମୁ	X	ମ୍ଚ/ ମୁ	ମ୍ହ/ ମୁ	ମ୍ଜ/ ମୁ	ମ୍ବ/ ମୁ	X
ସ	ସ୍କ/ ସୁ	ସ୍ଥ/ ସୁ	ସ୍ଗ/ ସୁ	ସ୍ସ/ ସୁ	ସ୍ଶ/ ସୁ	ସ୍ଚ/ ସୁ	ସ୍ଛ/ ସୁ	X	ସ୍ବ/ ସୁ	X
ର	ର୍କ	ର୍ଥ	ର୍ଗ	ର୍ସ	X	ର୍ଚ	ର୍ଛ	ର୍ଜ	ର୍ବ	X
ଲ	ଲ୍କ	ଲ୍ଥ/ ଲୁ	ଲ୍ଗ	ଲ୍ସ	ଲ୍ଶ/ ଲୁ	ଲ୍ଚ	ଲ୍ଛ	ଲ୍ଜ/ ଲୁ	ଲ୍ବ/ ଲୁ	ଲ୍ପ୍ର/ ଲୁ
ବ	ବ୍ର୍କ/ ବୁ	ବ୍ର୍ଥ	ବ୍ର୍ଗ	ବ୍ର୍ସ	ବ୍ର୍ଶ/ ବୁ	ବ୍ର୍ଚ	ବ୍ର୍ଛ	ବ୍ର୍ଜ/ ବୁ	ବ୍ର୍ବ	ବ୍ର୍ପ୍ର/ ବୁ
ଶ	ଶ୍କ/ ଶୁ	ଶ୍ଥ	ଶ୍ଗ/ଶୁ	ଶ୍ସ	ଶ୍ଶ/ଶୁ	ଶ୍ଚ	ଶ୍ଛ	ଶ୍ଜ/ଶୁ	ଶ୍ବ	ଶ୍ପ୍ର/ଶୁ
ଷ	ଷ୍କ	ଷ୍ଥ	ଷ୍ଗ	ଷ୍ସ	ଷ୍ଶ/ଷୁ	ଷ୍ଚ	ଷ୍ଛ	ଷ୍ଜ/ଷୁ	ଷ୍ବ	ଷ୍ପ୍ର/ଷୁ
ସ	ସ୍କ	ସ୍ଥ	ସ୍ଗ	ସ୍ସ	ସ୍ଶ/ସୁ	ସ୍ଚ	ସ୍ଛ	ସ୍ଜ/ସୁ	ସ୍ବ	ସ୍ପ୍ର/ସୁ
ମ୍ବ	ମ୍ବ୍ର୍କ/ମ୍ବୁ	ମ୍ବ୍ର୍ଥ	ମ୍ବ୍ର୍ଗ	ମ୍ବ୍ର୍ସ	ମ୍ବ୍ର୍ଶ/ମ୍ବୁ	ମ୍ବ୍ର୍ଚ	ମ୍ବ୍ର୍ଛ	ମ୍ବ୍ର୍ଜ/ମ୍ବୁ	ମ୍ବ୍ର୍ବ	ମ୍ବ୍ର୍ପ୍ର/ମ୍ବୁ
ମ୍ବୁ	X	X	X	X	X	X	X	X	X	X

ঃ	X	X	X	X	X	X	X	X	X	X	X
ঃ	X	X	X	X	X	X	X	X	X	X	X
ঃ	X	X	X	X	X	X	X	X	X	X	X

## CHC Set 2:

The following set shows a combination of two consonants. To know how particular combinations forms, select one consonant from the first column and second from first row. For eg. Combination of consonant “ক” and “ট” is ligature “ষ্টো”.

CHC( combination of two consonants) - Set 2											
	ট	ঠ	ড	ঢ	ণ	ত	থ	দ	ধ	ন	
ক	ষ্টো/ ষ্ট	কষ্ট/ কষ্ট	কড়/ কড়	কঢ়/ কঢ়	কণ/ কণ	ক্ত/ ক্ত	কথ/ কথ	কদ/ কদ	কধ/ কধ	ক্ন/ ক্ন	
খ	খট/ খট	খঠ/ খঠ	খড়/ খড়	খঢ়/ খঢ়	খণ/ খণ	খ্ত/ খ্ত	খথ/ খথ	খদ/ খদ	খধ/ খধ	খ্ন/ খ্ন	
গ	গট/ গট	গঠ/ গঠ	গড়/ গড়	গঢ়/ গঢ়	গণ/ গণ	গ্ত/ গ্ত	গথ/ গথ	গদ/ গদ	গধ/ গধ	গ্ন/ গ্ন	
ঘ	ঘট/ ঘট	ঘঠ/ ঘঠ	ঘড়/ ঘড়	ঘঢ়/ ঘঢ়	ঘণ/ ঘণ	ঘ্ত/ ঘ্ত	ঘথ/ ঘথ	ঘদ/ ঘদ	ঘধ/ ঘধ	ঘ্ন/ ঘ্ন	
ঙ	ঙট/ ঙট	ঙঠ/ ঙঠ	ঙড়/ ঙড়	ঙঢ়/ ঙঢ়	ঙণ/ ঙণ	ঙ্ত/ ঙ্ত	ঙথ/ ঙথ	ঙদ/ ঙদ	ঙধ/ ঙধ	ঙ্ন/ ঙ্ন	
চ	চট/ চট	চঠ/ চঠ	চড়/ চড়	চঢ়/ চঢ়	চণ/ চণ	চ্ত/ চ্ত	চথ/ চথ	চদ/ চদ	চধ/ চধ	চ্ন/ চ্ন	
ছ	ছট/ ছট	ছঠ/ ছঠ	ছড়/ ছড়	ছঢ়/ ছঢ়	ছণ/ ছণ	ছ্ত/ ছ্ত	ছথ/ ছথ	ছদ/ ছদ	ছধ/ ছধ	ছ্ন/ ছ্ন	
জ	জট/ জট	জঠ/ জঠ	জড়/ জড়	জঢ়/ জঢ়	জণ/ জণ	জ্ত/ জ্ত	জথ/ জথ	জদ/ জদ	জধ/ জধ	জ্ন/ জ্ন	

	ବ୍ରୁଟ୍/କ୍ରୁଟ୍	ବ୍ରୁଠ୍/କ୍ରୁଠ୍	ବ୍ରୁଡ୍/କ୍ରୁଡ୍	ବ୍ରୁଟ୍/କ୍ରୁଟ୍	ବ୍ରୁଣ୍/ବ୍ରୁନ୍/କ୍ରୁନ୍	ବ୍ରୁତ୍/କ୍ରୁତ୍	ବ୍ରୁଥ୍/ବ୍ରୁଥୁସ୍/କ୍ରୁଥୁସ୍	ବ୍ରୁଦ୍/ବ୍ରୁଦୁସ୍/କ୍ରୁଦୁସ୍	ବ୍ରୁଧ୍/ବ୍ରୁଧୁସ୍/କ୍ରୁଧୁସ୍	ବ୍ରୁମ୍/ବ୍ରୁମୁସ୍/କ୍ରୁମୁସ୍
ଏଁ	ଏଁଟ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଠ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଡ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଟ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	X	ଏଁତ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଥ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଦ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	ଏଁଧ୍/ଏଁନ୍ଦ୍ରୀ କୁଷ୍ଟିଲ୍	X
ଟ୍	ଟ୍ରୁ	ଟ୍ରୁଠ୍	ଟ୍ରୁଡ୍	ଟ୍ରୁଟ୍	ଟ୍ରୁଣ୍	X	X	X	X	X
ଠ୍	ଠ୍ରୁଟ୍/କୁଷ୍ଟିଲ୍	ଠ୍ରୁଠ୍/କୁଷ୍ଟିଲ୍	ଠ୍ରୁଡ୍/କୁଷ୍ଟିଲ୍	ଠ୍ରୁଟ୍/କୁଷ୍ଟିଲ୍	ଠ୍ରୁଣ୍/କୁଷ୍ଟିଲ୍	X	X	X	X	X
ଡ୍	ଡ୍ରୁଟ୍	ଡ୍ରୁଠ୍	ଡ୍ରୁଡ୍	ଡ୍ରୁଟ୍	ଡ୍ରୁଣ୍	X	X	X	X	X
ଢ୍	ଢ୍ରୁଟ୍/କୁଷ୍ଟିଲ୍	ଢ୍ରୁଠ୍/କୁଷ୍ଟିଲ୍	ଢ୍ରୁଡ୍/କୁଷ୍ଟିଲ୍	ଢ୍ରୁଟ୍/କୁଷ୍ଟିଲ୍	ଢ୍ରୁଣ୍/କୁଷ୍ଟିଲ୍	X	X	X	X	X
ଣ୍	ଣ୍ଟ୍ରୁଟ୍	ଣ୍ଟ୍ରୁଥ୍	ଣ୍ଟ୍ରୁଡ୍	ଣ୍ଟ୍ରୁଟ୍	ଣ୍ଟ୍ରୁଣ୍	X	X	X	X	X
୯/୩	X	X	X	X	X	ତ୍ରୁ	ଥ୍ରୁ	ତ୍ରୁଦ୍/ହ୍ରୁଦୁସ୍	ତ୍ରୁଧ୍/ହ୍ରୁଧୁସ୍	ତ୍ରୁମ୍/ହ୍ରୁମୁସ୍
ଥ୍	X	X	X	X	X	X	ଥ୍ରୁଥ୍/ହ୍ରୁଥୁସ୍	ଥ୍ରୁଦ୍/ହ୍ରୁଦୁସ୍	ଥ୍ରୁଧ୍/ହ୍ରୁଧୁସ୍	ଥ୍ରୁମ୍/ହ୍ରୁମୁସ୍

ଦ	X	X	X	X	X	ଦ୍ର/ ତ୍ର	ଦ୍ର୍ଥ/ ତ୍ର୍ଥ	ଦ	ଦ୍ର	ଦ୍ର
ଧ	X	X	X	X	X	ଧ୍ର/ ତ୍ର୍ଷ	ଧ୍ର୍ଥ/ ତ୍ର୍ଷ୍ଥ	ଧ	ଧ୍ର	ଧ୍ର
ନ	X	X	X	X	X	ନ୍ତ	ନ୍ତ୍ର	ନ	ନ୍ତ	ନ
ପ	X	X	X	X	X	ପ୍ତ	ପ୍ର୍ଥ/	ପଦ	ପ୍ର୍ଥ/	ପ
ଫ	ଫ୍ଟ/ ଫ୍ଟ୍ଟ	ଫ୍ର୍ଠ/ ଫ୍ର୍ଟ୍ଟ	ଫ୍ର୍ଡ/ ଫ୍ର୍ଙ୍କ	ଫ୍ର୍ଟ/ ଫ୍ର୍ଣ୍ଟ	ଫ୍ର୍ଣ/	ଫ୍ର୍ତ/	ଫ୍ର୍ଥ/	ଫ୍ର୍ଦ/	ଫ୍ର୍ଥ୍ର/	ଫ୍ର
ବ	ବ୍ର୍ଟ/ ବ୍ର୍ଟ୍ଟ	ବ୍ର୍ଠ/	ବ୍ର୍ଡ/	ବ୍ର୍ଟ/	ବ୍ର୍ଣ/	ବ୍ର୍ତ/	ବ୍ର୍ଥ/	ବ	ବ୍ର	ବ
ଭ	ଭ୍ର୍ଟ/ ଭ୍ର୍ଟ୍ଟ	ଭ୍ର୍ଠ/	ଭ୍ର୍ଡ/	ଭ୍ର୍ଟ/	ଭ୍ର୍ଣ/	ଭ୍ର୍ତ/	ଭ୍ର୍ଥ/	ଭ୍ର୍ଦ/	ଭ୍ର୍ଥ୍ର/	ଭ
ମ	ମ୍ଟ୍ଟ/ ମ୍ଟ୍ଟ୍ଟ	ମ୍ଳ୍ଟ/	ମ୍ଡ୍ର/	ମ୍ଟ୍ର/	ମ୍ଣ/	ମ୍ତ୍ର/	ମ୍ଥ୍ର/	ମ୍ଦ୍ର	ମ୍ଥ୍ର୍ର/	ମ
ସ	ସ୍ଟ୍ଟ/ ସ୍ଟ୍ଟ୍ଟ	ସ୍ଳ୍ଟ୍ଟ/	ସ୍ର୍ଡ୍ର/	ସ୍ର୍ଟ୍ର/	ସ୍ର୍ମ/	ସ୍ର୍ତ୍ର/	ସ୍ର୍ଥ୍ର/	ସ୍ର୍ଦ୍ର	ସ୍ର୍ଥ୍ର୍ର/	ସ୍ର
ର	ର୍ଟ	ର୍ଠ	ର୍ଡ	ର୍ଟ	ର୍ଣ	ର୍ତ	ର୍ଥ	ର୍ଦ	ର୍ଥ୍ର	ର
ଲ	ଲ୍ଟ	ଲ୍ଠ	ଲ୍ଡ	ଲ୍ଟ	ଲ୍ଣ/	ଲ୍ତ/	ଲ୍ଥ/	ଲ୍ଦ	ଲ୍ଥ୍ର/	ଲ୍ନ/

ର୍	ରୁଟ୍/କୁଟ୍	ରୁଠ୍/କୁଠ୍	ରୁଡ୍/କୁଡ୍	ରୁତ୍/କୁଟ୍	ରୁଣ୍/କୁମ୍	ରୁତ୍/କୁତ୍	ରୁଥ୍/କୁମ୍	ରୁଦ୍/କୁମ୍	ରୁଧ୍/କୁମ୍	ରୁନ୍/କୁମ୍
ଶ୍	ଶୁଟ୍	ଶୁଠ୍	ଶୁଡ୍	ଶୁଟ୍	ଶୁଣ୍	ଶୁତ୍	ଶୁଥ୍	ଶୁଦ୍	ଶୁଧ୍	ଶୁନ୍
ସ୍	X	ଷ୍ଟେ/ଷ୍ଟି	ଷ୍ଟି	ଷ୍ଟୁ	ଷ୍ଟି	X	X	X	X	X
ସ୍	X	X	X	X	X	ସ୍ତୁ	ସ୍ତୁ	ସ୍ତୁ	ସ୍ତୁ	ସ୍ତୁ
ହ୍	X	ହୁଠ୍/କୁଠ୍	ହୁଡ୍/କୁଡ୍	ହୁତ୍/କୁତ୍	ହୁନ୍/କୁମ୍	ହୁତ୍/କୁତ୍	ହୁଥ୍/କୁମ୍	ହୁଦ୍/କୁମ୍	ହୁଧ୍/କୁମ୍	ହୁନ୍/କୁମ୍
କ୍ଷ	X	X	X	X	X	X	X	X	X	କ୍ଷୁନ୍
ଡ୍	X	X	X	X	X	X	X	X	X	X
ଢ୍	X	X	X	X	X	X	X	X	X	X
ଯ୍	X	X	X	X	X	X	X	X	X	X

### CHC SET 3:

The following set shows a combination of two consonants. To know how particular combinations forms, select one consonant from the first column and second from first row. For eg. Combination of consonant “ক” and “ম” is the ligature “ক্ল”.

**CHC( combination of two consonants) - Set 3**

	প	ফ	ব	ভ	ম	য	র	ল	ব	শ	ষ	স	হ	ঞ	ড	ঢ	য
ক	কপ/ ক্ল	কফ/ ক্ল	ক/ ক্ল	কভ/ ক্ল	ক্ল	ক্ল	ক্র/ ক্ল	ক্ল	ক্ল	ক্ল	ক্ল	ক্ল	কহ/ ক্ল	X	X	X	ক্ল
খ	খপ/ খ্ল	খফ/ খ্ল	খ	খভ/ খ্ল	খ্ল	খ	খ্র/ খ্ল	খ্ল	খ্র/ খ্ল	খ্র/ খ্ল	খ্র/ খ্ল	খ্স/ খ্ল	খহ/ খ্ল	X	X	X	খ্ল
গ	গপ/ গ্ল	গফ/ গ্ল	গ	গভ/ গ্ল	গ্ল	গ	গ্র/ গ্ল	গ্ল	গ্র/ গ্ল	গ্র/ গ্ল	গ্র/ গ্ল	গ্স/ গ্ল	গহ/ গ্ল	X	X	X	গ্ল
ঘ	ঘপ/ ঘ্ল	ঘফ/ ঘ্ল	ঘ	ঘভ/ ঘ্ল	ঘ্ল	ঘ	ঘ্র/ ঘ্ল	ঘ্ল	ঘ্র/ ঘ্ল	ঘ্র/ ঘ্ল	ঘ্র/ ঘ্ল	ঘ্স/ ঘ্ল	ঘহ/ ঘ্ল	X	X	X	ঘ্ল
ঙ	ঙপ/ ঙ্গ	ঙফ/ ঙ্গ	ঙ	ঙভ/ ঙ্গ	ঙ্গ	ঙ	ঙ্গ/ ঙ্গ	ঙ্গ	ঙ্গ/ ঙ্গ	ঙ্গ/ ঙ্গ	ঙ্গ/ ঙ্গ	ঙ্স/ ঙ্গ	ঙহ/ ঙ্গ	X	X	X	ঙ্গ
চ	চপ/ চ্ল	চফ/ চ্ল	চ	চভ/ চ্ল	চ্ল	চ	চ্র/ চ্ল	চ্ল	চ্র/ চ্ল	চ্র/ চ্ল	চ্র/ চ্ল	চ্স/ চ্ল	চহ/ চ্ল	X	X	X	চ্ল
ছ	ছপ/ ছ্ল	ছফ/ ছ্ল	ছ	ছভ/ ছ্ল	ছ্ল	ছ	ছ্র/ ছ্ল	ছ্ল	ছ্র/ ছ্ল	ছ্র/ ছ্ল	ছ্র/ ছ্ল	ছ্স/ ছ্ল	ছহ/ ছ্ল	X	X	X	ছ্ল
জ	জপ/ জ্ল	জফ/ জ্ল	জ	জভ/ জ্ল	জ্ল	জ	জ্র/ জ্ল	জ্ল	জ্র/ জ্ল	জ্র/ জ্ল	জ্র/ জ্ল	জ্স/ জ্ল	জহ/ জ্ল	X	X	X	জ্ল

କ୍ର.	ବ୍ୟାପ/ କମ୍ପ୍	ବ୍ୟକ୍ତି/ କହୁ	କ୍ଷା	ବ୍ୟାତ୍/ କଣ୍ଠ	ବ୍ୟମ୍/କାନ୍ଦା	X	ବ୍ୟା/କାନ୍ଦା	ବ୍ୟା/କାନ୍ଦା	ବ୍ୟାର୍/କାନ୍ଦାର୍	ବ୍ୟଶ/କାନ୍ଦାଶ	ବ୍ୟଷ/କାନ୍ଦାଷ	ବ୍ୟସ/କାନ୍ଦାସ	ବ୍ୟାହ୍/କାନ୍ଦାହ୍	X	X	X	X	X	
୧	ଏଁପ୍ / ଏମ୍	ଏଁଫ୍ / ଏଫ୍ଟୁ		ଏଁଭ୍ / ଏଫ୍ଟୁ	ଏଁମ୍ / ଏଫ୍ଟୁ		ଏଁଲ୍ / ଏଫ୍ଟୁ	ଏଁର୍ / ଏଫ୍ଟୁ	ଏଁଶ୍ / ଏଫ୍ଟୁ	ଏଁଷ୍ / ଏଫ୍ଟୁ	ଏଁସ୍ / ଏଫ୍ଟୁ	ଏଁଟ୍ସ୍ / ଏଫ୍ଟୁ	ଏଁଟ୍ସ୍ସ୍ / ଏଫ୍ଟୁ	ଏଁଟ୍ସ୍ସୁ / ଏଫ୍ଟୁ	X	X	X	X	X
୨	ଟ୍ଟି	ଟ୍ଟିପ୍ / ଟ୍ଟିପ୍	ଟ୍ଟି	ଟ୍ଟିଭ୍ / ଟ୍ଟିଟ୍ରୁ	ଟ୍ଟିମ୍	ଟ୍ଟିଷ୍	ଟ୍ଟିଟ୍ରୀ	ଟ୍ଟିର୍ / ଟ୍ଟିଟ୍ରୁ	ଟ୍ଟିଶ୍ / ଟ୍ଟିଟ୍ରୁ	ଟ୍ଟିଷ୍ସ୍ / ଟ୍ଟିଟ୍ରୁ	ଟ୍ଟିସ୍ / ଟ୍ଟିଟ୍ରୁ	ଟ୍ଟିହ୍ / ଟ୍ଟିଟ୍ରୁ	X	X	X	ଟ୍ଟୀ			
୩	ଠ୍ଟି	ଠ୍ଟିପ୍ / ଠ୍ଟିପ୍ଟୁ	ଠ୍ଟି	ଠ୍ଟିଭ୍ / ଠ୍ଟିଟ୍ରୁ	ଠ୍ଟିମ୍	ଠ୍ଟିଷ୍	ଠ୍ଟିଟ୍ରୀ	ଠ୍ଟିର୍ / ଠ୍ଟିଟ୍ରୁ	ଠ୍ଟିଶ୍ / ଠ୍ଟିଟ୍ରୁ	ଠ୍ଟିଷ୍ସ୍ / ଠ୍ଟିଟ୍ରୁ	ଠ୍ଟିସ୍ / ଠ୍ଟିଟ୍ରୁ	ଠ୍ଟିହ୍ / ଠ୍ଟିଟ୍ରୁ	X	X	X	ଠ୍ଟୀ			
୪	ଡ୍ରୁ	ଡ୍ରାଫ୍ / ଡ୍ରାଫ୍ଟୁ		ଡ୍ରାଭ୍ / ଡ୍ରାଫ୍ଟୁ	ଡ୍ରାମ୍	ଡ୍ରାଷ୍	ଡ୍ରାଫ୍ଟ୍ରୀ	ଡ୍ରାର୍ / ଡ୍ରାଫ୍ଟୁ	ଡ୍ରାଶ୍ / ଡ୍ରାଫ୍ଟୁ	ଡ୍ରାଷ୍ସ୍ / ଡ୍ରାଫ୍ଟୁ	ଡ୍ରାସ୍ / ଡ୍ରାଫ୍ଟୁ	ଡ୍ରାହ୍ / ଡ୍ରାଫ୍ଟୁ	X	X	X	ଡ୍ରୀ			
୫	ଢ୍ରୀ	ଢ୍ରାଫ୍ / ଢ୍ରାଫ୍ଟୁ		ଢ୍ରାଭ୍ / ଢ୍ରାଫ୍ଟୁ	ଢ୍ରାମ୍	ଢ୍ରାଷ୍	ଢ୍ରାଫ୍ଟ୍ରୀ	ଢ୍ରାର୍ / ଢ୍ରାଫ୍ଟୁ	ଢ୍ରାଶ୍ / ଢ୍ରାଫ୍ଟୁ	ଢ୍ରାଷ୍ସ୍ / ଢ୍ରାଫ୍ଟୁ	ଢ୍ରାସ୍ / ଢ୍ରାଫ୍ଟୁ	ଢ୍ରାହ୍ / ଢ୍ରାଫ୍ଟୁ	X	X	X	ଢ୍ରୀ			
୬	ଚ୍ରୀ	ଚ୍ରାଫ୍ / ଚ୍ରାଫ୍ଟୁ		ଚ୍ରାଭ୍ / ଚ୍ରାଫ୍ଟୁ	ଚ୍ରାମ୍	ଚ୍ରାଷ୍	ଚ୍ରାଫ୍ଟ୍ରୀ	ଚ୍ରାର୍ / ଚ୍ରାଫ୍ଟୁ	ଚ୍ରାଶ୍ / ଚ୍ରାଫ୍ଟୁ	ଚ୍ରାଷ୍ସ୍ / ଚ୍ରାଫ୍ଟୁ	ଚ୍ରାସ୍ / ଚ୍ରାଫ୍ଟୁ	ଚ୍ରାହ୍ / ଚ୍ରାଫ୍ଟୁ	X	X	X	ଚ୍ରୀ			
୭	ଶ୍ରୀ	ଶ୍ରାଫ୍ / ଶ୍ରାଫ୍ଟୁ		ଶ୍ରାଭ୍ / ଶ୍ରାଫ୍ଟୁ	ଶ୍ରାମ୍	ଶ୍ରାଷ୍	ଶ୍ରାଫ୍ଟ୍ରୀ	ଶ୍ରାର୍ / ଶ୍ରାଫ୍ଟୁ	ଶ୍ରାଶ୍ / ଶ୍ରାଫ୍ଟୁ	ଶ୍ରାଷ୍ସ୍ / ଶ୍ରାଫ୍ଟୁ	ଶ୍ରାସ୍ / ଶ୍ରାଫ୍ଟୁ	ଶ୍ରାହ୍ / ଶ୍ରାଫ୍ଟୁ	X	X	X	ଶ୍ରୀ			
୮	ତ୍ରୀ	ତ୍ରାଫ୍ / ତ୍ରାଫ୍ଟୁ		ତ୍ରାଭ୍ / ତ୍ରାଫ୍ଟୁ	ତ୍ରାମ୍	ତ୍ରାଷ୍	ତ୍ରାଫ୍ଟ୍ରୀ	ତ୍ରାର୍ / ତ୍ରାଫ୍ଟୁ	ତ୍ରାଶ୍ / ତ୍ରାଫ୍ଟୁ	ତ୍ରାଷ୍ସ୍ / ତ୍ରାଫ୍ଟୁ	ତ୍ରାସ୍ / ତ୍ରାଫ୍ଟୁ	ତ୍ରାହ୍ / ତ୍ରାଫ୍ଟୁ	X	X	X	ତ୍ରୀ			
୯	ଥ୍ରୀ	ଥ୍ରାଫ୍ / ଥ୍ରାଫ୍ଟୁ		ଥ୍ରାଭ୍ / ଥ୍ରାଫ୍ଟୁ	ଥ୍ରାମ୍	ଥ୍ରାଷ୍	ଥ୍ରାଫ୍ଟ୍ରୀ	ଥ୍ରାର୍ / ଥ୍ରାଫ୍ଟୁ	ଥ୍ରାଶ୍ / ଥ୍ରାଫ୍ଟୁ	ଥ୍ରାଷ୍ସ୍ / ଥ୍ରାଫ୍ଟୁ	ଥ୍ରାସ୍ / ଥ୍ରାଫ୍ଟୁ	ଥ୍ରାହ୍ / ଥ୍ରାଫ୍ଟୁ	X	X	X	ଥ୍ରୀ			

ଦ	ଦ୍ର୍ପ/ ଦ୍ରମ	ଦ୍ରଫ୍/ଦ୍ରହ୍ମ	ଦ୍ର	ଦ୍ର	ଦ୍ରା	ଦ୍ର	ଦ୍ରଳ/ଦ୍ରମ	ଦ୍ରବ/ଦ୍ରହ୍ମ	ଦ୍ରଶ୍/ଦ୍ରାଶ୍	ଦ୍ରସ୍/ଦ୍ରାଶ୍	ଦ୍ରସ୍/ଦ୍ରାଶ୍	ଦ୍ରସ୍/ଦ୍ରାଶ୍	ଦ୍ରତ୍/ଦ୍ରି	X	X	X	ଦ
ଥ	ଥ୍ର୍ପ/ଥ୍ରମ	ଥ୍ର୍ଫ/ଥ୍ରହ୍ମ	ଥ୍ର୍ବ/ଥ୍ରଟ୍	ଥ୍ର୍ମ	ଥ୍ର୍ମ	ଥ୍ର୍ମ	ଥ୍ର୍ଲ/ଥ୍ରମ	ଥ୍ର୍ବର/ଥ୍ରହ୍ମର	ଥ୍ର୍ମଶ୍/ଥ୍ରମଶ୍	ଥ୍ର୍ମଶ୍/ଥ୍ରମଶ୍	ଥ୍ର୍ମଶ୍/ଥ୍ରମଶ୍	ଥ୍ର୍ମଶ୍/ଥ୍ରମଶ୍	ଥ୍ର୍ମଶ୍/ଥ୍ରମଶ୍	X	X	X	ଥ
ନ	ନ୍ପ/ନ୍ମ	ନ୍ଫ/ନ୍ମ	ନ୍ବ	ନ୍ତ୍ର/ନ୍ତ୍ର	ନ୍ମ	ନ୍ମ	ନ୍ର/ନ୍ମ	ନ୍ର/ନ୍ମ	ନ୍ଶ/ନ୍ମ	ନ୍ର/ନ୍ମ	ନ୍ର/ନ୍ମ	ନ୍ର/ନ୍ମ	ନ୍ର/ନ୍ମ	X	X	X	ନ୍ୟ
ପ	ପ୍ର୍ଣୀ	ପ୍ର୍ଫ/ପ୍ର୍ମ	ପ୍ର୍ବ	ପ୍ର୍ତ୍ତ/ପ୍ର୍ତ୍ତ	ପ୍ର୍ମ	ପ୍ର୍ମ	ପ୍ର୍ବ	ପ୍ର୍ବ	ପ୍ର୍ଶ/ପ୍ର୍ମ	ପ୍ର୍ଶ/ପ୍ର୍ମ	ପ୍ର୍ଶ/ପ୍ର୍ମ	ପ୍ର୍ଶ/ପ୍ର୍ମ	ପ୍ର୍ଶ/ପ୍ର୍ମ	X	X	X	ପ୍ୟ
ଫ	ଫ୍ର୍ପ/ଫ୍ର୍ମ	ଫ୍ର୍ଫ/ଫ୍ର୍ମ	ଫ୍ର୍ବ	ଫ୍ର୍ତ୍ତ/ଫ୍ର୍ତ୍ତ	ଫ୍ର୍ମ	ଫ୍ର୍ମ	ଫ୍ର୍ବ	ଫ୍ର୍ବ	ଫ୍ର୍ଶ/ଫ୍ର୍ମ	ଫ୍ର୍ଶ/ଫ୍ର୍ମ	ଫ୍ର୍ଶ/ଫ୍ର୍ମ	ଫ୍ର୍ଶ/ଫ୍ର୍ମ	ଫ୍ର୍ଶ/ଫ୍ର୍ମ	X	X	X	ଫ୍ୟ
ବ	ବ୍ର୍ପ/ବ୍ର୍ମ	ବ୍ର୍ଫ/ବ୍ର୍ମ	ବ୍ର୍ବ	ବ୍ର୍ତ	ବ୍ର୍ମ	ବ୍ର୍ମ	ବ୍ର୍ବ	ବ୍ର୍ବ	ବ୍ର୍ଶ/ବ୍ର୍ମ	ବ୍ର୍ଶ/ବ୍ର୍ମ	ବ୍ର୍ଶ/ବ୍ର୍ମ	ବ୍ର୍ଶ/ବ୍ର୍ମ	ବ୍ର୍ଶ/ବ୍ର୍ମ	X	X	X	ବ୍ୟ
ଭ	ଭ୍ର୍ପ/ଭ୍ର୍ମ	ଭ୍ର୍ଫ/ଭ୍ର୍ମ	ଭ୍ର୍ବ	ଭ୍ର୍ତ୍ତ/ଭ୍ର୍ତ୍ତ	ଭ୍ର୍ମ	ଭ୍ର୍ମ	ଭ୍ର୍ବ	ଭ୍ର୍ବ	ଭ୍ର୍ଶ/ଭ୍ର୍ମ	ଭ୍ର୍ଶ/ଭ୍ର୍ମ	ଭ୍ର୍ଶ/ଭ୍ର୍ମ	ଭ୍ର୍ଶ/ଭ୍ର୍ମ	ଭ୍ର୍ଶ/ଭ୍ର୍ମ	X	X	X	ଭ୍ୟ
ମ	ମ୍ପ	ମ୍ଫ	ମ୍ବ	ମ୍ତ	ମ୍ମ	ମ୍ମ	ମ୍ବ	ମ୍ବ	ମ୍ରଶ/ମ୍ମ	ମ୍ରଶ/ମ୍ମ	ମ୍ରଶ/ମ୍ମ	ମ୍ରଶ/ମ୍ମ	ମ୍ରଶ/ମ୍ମ	X	X	X	ମ୍ୟ
ସ	ସ୍ପ୍ର୍ମ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ଫ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ବ	ସ୍ପ୍ର୍ତ୍ତ/ସ୍ପ୍ର୍ତ୍ତ	ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ବ	ସ୍ପ୍ର୍ବ	ସ୍ପ୍ର୍ଶ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ଶ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ଶ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ଶ/ସ୍ପ୍ର୍ମ	ସ୍ପ୍ର୍ଶ/ସ୍ପ୍ର୍ମ	X	X	X	ସ୍ୟ
ର	ର୍ପ	ର୍ଫ	ର୍ବ	ର୍ତ	ର୍ମ	ର୍ମ	ର୍ବ	ର୍ବ	ର୍ଶ/ର୍ମ	ର୍ଶ/ର୍ମ	ର୍ଶ/ର୍ମ	ର୍ଶ/ର୍ମ	ର୍ଶ/ର୍ମ	X	X	X	ର୍ୟ

ଲ୍	ଙ୍ଗ/ ଙ୍ଗୀ	ଙ୍କ/ ଙ୍କୁ	ଙ୍ଗ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ	ଙ୍ଗ	ଙ୍ଗ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ/ ଙ୍ଗୁ	ଙ୍ଗ/ ଙ୍ଗୁ	X	X	X	ଲ୍ୟ
ର୍	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	ର୍ୟ
ଶ୍	ଶ୍ପ/ ଶ୍ପୀ	ଶ୍ଫ/ ଶ୍ଫୂ	ଶ୍ର	ଶ୍ବ/ ଶ୍ବୁ	ଶ୍ରୀ	ଶ୍ରୀ	ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	ଶ୍ରୀ/ ଶ୍ରୀ	X	X	X	ଶ୍ରୀୟ
ଷ୍	ଷ୍ପୀ	ଷ୍ଫୂ	ଷ୍ରୀ	ଷ୍ବୁ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	ଷ୍ରୀ	X	X	X	ଷ୍ରୀୟ
ତ୍	ତ୍ପ	ତ୍ଫ	ତ୍ରୀ	ତ୍ବୁ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	ତ୍ରୀ	X	X	X	ତ୍ରୀୟ
ସ୍	ସ୍ପ	ସ୍ଫ	ସ୍ର	ସ୍ବ/ ସ୍ବୁ	ସ୍ପୀ/ ସ୍ପୀୟ	ସ୍ଫୂ/ ସ୍ଫୂୟ	ସ୍ରୀ/ ସ୍ରୀୟ	ସ୍ବୀ/ସ୍ବୀୟ	X	X	X	ସ୍ରୀୟ	ସ୍ରୀୟ	X	X	X	ସ୍ରୀୟ
ହ୍	ହ୍ପ/ ହ୍ପୀ	ହ୍ଫ/ ହ୍ଫୂ	ହ୍ରୀ	ହ୍ବୁ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	ହ୍ରୀ	X	X	X	ହ୍ରୀୟ
କ୍ଷ	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	କ୍ଷୀୟ
ଡ୍	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ଢ୍	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
ଯ୍	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

### 6.3.3.2 CHCHC ( combination of three consonants)

These are not as frequent as the CHC combinations. Only the major are listed below.

These combinations are valid only for ର and ଯ as the third consonant. These are nothing but CHC with RAKAR or JYAKAR.

ମ + ପ + ର	ମ୍ପର
ଯ + ପ + ର	ଯ୍ପର
ମ + ତ + ର	ମ୍ତର
ଯ + ତ + ର	ଯ୍ତର
ନ + ତ + ର	ନ୍ତର
ନ + ଦ + ର	ନ୍ଦର
ଣ + ତ + ର	ଣ୍ଟର
ନ + ଥ + ର	ନ୍ଥର
ନ + ତ + ଯ	ନ୍ତ୍ୟ
ନ + ଦ + ଯ	ନ୍ଦ୍ୟ
ଣ + କ + ର	ଣ୍ଟର

ঁ + গ + ৰ	ঁংগ্ৰ
ম + প + ৰ	ম্প্ৰ
ম + ত + ৰ	ম্ত্ৰ
ঁ + গ + য	ঁংজ্ৰ
ঁ + ঘ + য	ঁংঘ্য
ঁ + খ + য	ঁংখ্য/ঁংঘ্য
ৰ + ঘ + য	ঘ্য/ঁংঘ্য

### 6.3.3.3.CHCHCHC ( Combination of four Consonants)

Not valid in Assamese.

### 6.3.4 The Collation Order of Assamese.

Collation is one of the most important features of a script grammar. It determines the order in which a given culture indexes its characters. This is best seen in a dictionary sort where for easy search words are sorted and arranged in a specific order. Within a given script, each allo-script may have a different sort-order. Thus in Devanagari the conjunct glyph କ୍ଷୀ is sorted along with କ, since the first letter of that conjunct is କ and on a similar principle ଙ୍କୀ is sorted along with ଙ. In Nepali, the two conjunct glyphs are given at the end of the sort order. Different scripts admit different sort orders and for all high-end NLP applications, sort is a crucial feature to ensure that the applications index data as per the cultural perception of that community. In quite a few States, sort order is clearly defined by the statutory bodies of that state and hence it is crucial that such sort order be ascertained and introduced in the script grammar.

In the case of Assamese the following is the traditional sort order as determined by the experts.

অ	অ	আ	ই	ঈ	উ	উ	ঁ	ঁ	এ	ঁ	ও	ঁ
ঁ	ঁ	ঁ	ক	খ	গ	ঁ	ঁ	চ	ছ	জ	ঁ	ব
ঁ	ট	ঁ	ড	ঁ	ণ	ত	থ	দ	ধ	ন	প	
ফ	ব	ত	ম	য	ঁ	ৰ	ল	ৱ	শ	ষ	স	
হ	ক্ষ	ড	ঁ	ঁ	ি	ঁ	ু	ু	ু	ু	ো	ৈ
ো	ৌ											

In Tabular format:

অ	অ	আ	ই	ঈ	উ	উ	ঁ	ঁ	এ	ঁ	ও	ঁ
ও	ঁ	ঁ	ঁ	ঁ	ক	খ	গ	ঁ	ঁ	ঁ	ঁ	ঁ
চ	ছ	জ	ঁ	ব	ঁ	ট	ঁ	ড	ত	ঁ	ন	ণ
ত	থ	দ	ধ	ন	প	ফ	ব	ৰ	ভ	ম	ৰ	ম
য	ঁ	ব	ল	ৱ	শ	ষ	স	ু	হ	ক্ষ		
ড	ঁ	ঁ	ি	ঁ	ী	ু	ু	ু	ো	ৈ		

ଶେ	ଶେ								
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## 7. REFERENCES

1. <http://www.unicode.org>
2. ISCII'91

## **8. ANNEXURES**

**Annexure 1: Names of experts who have contributed to the script grammar**

## **Annexure 2: Unicode Table of Assamese**

**Link: <http://unicode.org/charts/PDF/U0980.pdf>**

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The Unicode chart provided is for version 5.1 since the Script Grammar was prepared at that time. No considerable change in the script grammar can be seen in the updated versions of Unicode, with the possible addition of the Rupee Sign U+02B9