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Proposal to Encode Indic Siyaq Numbers in Unicode

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1 Introduction

This is a proposal to encode Indic Siyaq Numbers in the Unicode standard. A description of the typology of the numbers and the encoding model have been presented in the following documents:

- L2/07-414 "Proposal to Encode Siyaq Numerals"
- L2/09-166 "Raqm Numerals: Towards a Model for Encoding Numerals of the Siyaq Systems"
- L2/11-270 "Preliminary Proposal to Encode Indic Siyaq Numbers in the UCS"

Apart from editorial changes and the inclusion of new figures, the major changes from earlier versions are:

- Renaming of forms of primary numbers used in compounds from 'alternate' to 'prefixed' (see § 4.3).
- Addition of true alternate forms of some numbers (see § 4.2, 4.8, 4.10).
- Expanded discussion of the orthography of 'lakhs' and 'crores'.

Proposals to encode characters of three other Siyaq systems have been submitted:

- L2/15-066 "Proposal to Encode Diwani Siyaq Numbers in Unicode"
- L2/15-072 "Proposal to Encode Ottoman Siyaq Numbers in Unicode"
- L2/15-122 "Proposal to Encode Persian Siyaq Numbers in Unicode"

2 Background

The Siyaq (Arabic سياق *siyāq* 'order') numerical notation system is known in India and other parts of South Asia as *raqm* or *rakam* (Arabic رقم *raqm* 'account'). Similar to other Siyaq traditions, the Indic Siyaq Numbers are a specialized subset of the Arabic script that was used for accounting and in general for recording numbers. The basic Indic Siyaq Numbers are stylized monograms of the Arabic names for numbers. The numbers for large decimal orders, however, are derived from words of Indic languages. The period during which Siyaq was introduced in India is difficult to determine, but the system was in common usage under the Mughals by the 17th century and it remained in usage into the middle of the 20th century.

While the majority of documents containing Siyaq are hand-written, there is a rare instance of Indic Siyaq Numbers in print. A work by Francis Gladwin titled *A Compendious System of Bengal Revenue Accounts* (Calcutta: Manuel Cantopher, 1790) is perhaps the first book in which Siyaq is printed using metal types. In the preface, Gladwin writes "that the following compendium of Siyak Accounts is the first specimen of the sort that has yet appeared in print, the types having been made purposely for it" (p. vii). A specimen of Indic Siyaq Numbers printed using Gladwin's metal fonts is given in figure 2. Indic Siyaq Numbers also appear on currency notes and stamp papers. Charts of the numbers were included in various grammar books of Urdu as recently as 1999.

There are two major styles of Siyaq used in India, the northern and 'Deccani' or southern style. In general, the number forms and notation system of the two are identical. Minor points of difference lie in the orthography for the thousands, ten thousands, and lakhs.

3 Script Details

Block name The proposed characters belong to a block named 'Indic Siyaq Numbers'. The name 'Raqm' is specified as an alias in the names list.

Character repertoire and representative glyphs The character repertoire and representative glyphs are based upon Siyaq forms used throughout India and greater South Asia, as attested in written and printed sources. The numbers are quite uniform. The digitized glyphs used here were developed by the proposal author, with some glyphic elements sourced from the Jameel Noori Nastaleeq font.

Structure Indic Siyaq Numbers represent units of a decimal positional system. The notation system is additive, that is, the numeric value of a Siyaq number sequence is the sum of all characters. There is no character for zero; it is inherently represented in the distinct numbers for the various decimal orders. There are distinctive numbers for the primary units, tens, hundreds, thousands, and ten thousands. The hundred thousands, millions, and higher orders are represented using unit marks and numbers of smaller orders.

Directionality Indic Siyaq Numbers are written right-to-left in the regular manner of the Arabic script. The orientation differs from the Arabic-Indic digits, which are written left-to-right.

Ordering The ordering of Indic Siyaq Numbers is visual, which reflects the method of expressing numbers in Arabic. In a Siyaq sequence the largest number occurs first and smaller units follow in order to the left. An exception occurs for compound numbers of the tens and primary units; these are written transposed, with a 'prefixed' form of the primary unit placed before the larger number.

Positioning and orientation In a numerical sequence the largest number occurs first and smaller units follow in order to the left. If a number has a horizonal stroke that extends leftward, then the following number is generally raised and positioned above its stroke. This stack is oriented in a south-east to north-west direction. Such positioning has the effect of setting Indic Siyaq Numbers slightly apart from surrounding content in running text, which is typically Urdu or Persian. The baseline for Siyaq numbers ascends right to left, while the baseline for Urdu in the *nastalīq* style descends from right to left.

Script environment Indic Siyaq Numbers are generally used within an Arabic script environment and within Urdu and Persian linguistic contexts. The numbers may also occur in multilingual environments alongside other scripts. Arabic-Indic digits may be used within Siyaq sequences, particularly for the representation of small currency units (see § 5.10).

Characters not proposed There are signs for agricultural units. However, materials containing these characters have not yet been made available to the proposal author. These signs may be proposed for encoding at a later date.

4 Characters Proposed

4.1 Primary numbers

The following 9 characters are used for representing the primary units:

- عصم INDIC SIYAQ NUMBER ONE
- عصا INDIC SIYAQ NUMBER TWO
- ے INDIC SIYAQ NUMBER THREE
- للہ INDIC SIYAQ NUMBER FOUR
- حہ INDIC SIYAQ NUMBER FIVE
- ے INDIC SIYAQ NUMBER SIX
- ھہ INDIC SIYAQ NUMBER SEVEN
- ے INDIC SIYAQ NUMBER EIGHT
- لہ INDIC SIYAQ NUMBER NINE

The number عصا TWO has the glyphic variant عصا.

4.2 Alternate forms of the primary numbers

The following forms of the primary numbers are often used in place of or alongside the regular forms. They are proposed for encoding on account of their distinctive shapes and concurrent usage with the regular forms:

- عہ INDIC SIYAQ NUMBER ALTERNATE ONE
- عا INDIC SIYAQ NUMBER ALTERNATE TWO

The ALTERNATE TWO has the glyphic variant عا.

4.3 Prefixed forms of the primary numbers

The following 9 characters are used for the primary numbers in compounds:

- لہ INDIC SIYAQ NUMBER PREFIXED ONE
- عـ INDIC SIYAQ NUMBER PREFIXED TWO

𞲥 INDIC SIYAQ NUMBER PREFIXED THREE

𞲦 INDIC SIYAQ NUMBER PREFIXED FOUR

𞲧 INDIC SIYAQ NUMBER PREFIXED FIVE

𞲨 INDIC SIYAQ NUMBER PREFIXED SIX

𞲩 INDIC SIYAQ NUMBER PREFIXED SEVEN

𞲪 INDIC SIYAQ NUMBER PREFIXED EIGHT

𞲫 INDIC SIYAQ NUMBER PREFIXED NINE

The ‘prefixed’ forms are not glyphic variants. They are used in place of the regular primary number in compound numbers with the tens, ten thousands, tens of lakhs (millions), and crores (tens of millions). They are named ‘prefixed’ because they are written before the larger number and they are not used independently. A comparison of the regular, alternate, and prefixed forms is shown below:

	ONE	TWO	THREE	FOUR	FIVE	SIX	SEVEN	EIGHT	NINE
Regular	𞱱	𞱲	𞱳	𞱴	𞱵	𞱶	𞱷	𞱸	𞱹
Alternate	𞲱	𞲲	—	—	—	—	—	—	—
Prefixed	𞲣	𞲤	𞲥	𞲦	𞲧	𞲨	𞲩	𞲪	𞲫

4.4 Tens

The following 9 characters are used for representing the tens:

𞱺 INDIC SIYAQ NUMBER TEN

𞱻 INDIC SIYAQ NUMBER TWENTY

𞱼 INDIC SIYAQ NUMBER THIRTY

𞱽 INDIC SIYAQ NUMBER FORTY

𞱾 INDIC SIYAQ NUMBER FIFTY

𞱿 INDIC SIYAQ NUMBER SIXTY

𞲀 INDIC SIYAQ NUMBER SEVENTY

𞲁 INDIC SIYAQ NUMBER EIGHTY

𞲂 INDIC SIYAQ NUMBER NINETY

4.5 Hundreds

The following 9 characters are used for representing the hundreds:

ما	INDIC SIYAQ NUMBER ONE HUNDRED
مالہ	INDIC SIYAQ NUMBER TWO HUNDRED
سما	INDIC SIYAQ NUMBER THREE HUNDRED
اعا	INDIC SIYAQ NUMBER FOUR HUNDRED
حما	INDIC SIYAQ NUMBER FIVE HUNDRED
سما	INDIC SIYAQ NUMBER SIX HUNDRED
لما	INDIC SIYAQ NUMBER SEVEN HUNDRED
لما	INDIC SIYAQ NUMBER EIGHT HUNDRED
٩ما	INDIC SIYAQ NUMBER NINE HUNDRED

4.6 Thousands

The following 9 characters are used for representing the thousands:

الـــ	INDIC SIYAQ NUMBER ONE THOUSAND
اعمـــ	INDIC SIYAQ NUMBER TWO THOUSAND
سمـــ	INDIC SIYAQ NUMBER THREE THOUSAND
للعمـــ	INDIC SIYAQ NUMBER FOUR THOUSAND
حمـــ	INDIC SIYAQ NUMBER FIVE THOUSAND
سمـــ	INDIC SIYAQ NUMBER SIX THOUSAND
معمـــ	INDIC SIYAQ NUMBER SEVEN THOUSAND
ممـــ	INDIC SIYAQ NUMBER EIGHT THOUSAND
لعمـــ	INDIC SIYAQ NUMBER NINE THOUSAND

4.7 Ten Thousands

The following 9 characters are used for representing the ten thousands:

عـــ	INDIC SIYAQ NUMBER TEN THOUSAND
عمـــ	INDIC SIYAQ NUMBER TWENTY THOUSAND

INDIC SIYAQ NUMBER THIRTY THOUSAND

INDIC SIYAQ NUMBER FORTY THOUSAND

INDIC SIYAQ NUMBER FIFTY THOUSAND

INDIC SIYAQ NUMBER SIXTY THOUSAND

INDIC SIYAQ NUMBER SEVENTY THOUSAND

INDIC SIYAQ NUMBER EIGHTY THOUSAND

INDIC SIYAQ NUMBER NINETY THOUSAND

The ten thousands are modified forms of the tens that possess horizontal terminals instead of loops. On account of this structure, six numbers of this order resemble prefixed forms of the primary numbers:

	1	2	3	4	5	6	7	8	9
Ten thousands									
Prefixed forms of primary numbers									

The shapes of TEN THOUSAND, TWENTY THOUSAND, and EIGHTY THOUSAND differ from the corresponding PREFIXED ONE, PREFIXED TWO, and PREFIXED EIGHT. The difference between similar characters of the two sets lies in the length of the horizontal stroke. Apart from this graphical difference, the respective sets can be identified through context.

4.8 Alternate form of ten thousand

The following character is also used for representing ten thousand:

INDIC SIYAQ NUMBER ALTERNATE TEN THOUSAND

Its form is based upon the pattern for the 2–9 thousands, ie. TWO THOUSAND, THREE THOUSAND ... NINE THOUSAND, ALTERNATE TEN THOUSAND. It is proposed for encoding as a separate character on account of its distinctive shape and concurrent usage with the regular form.

4.9 Lakh (hundred thousand)

The following 3 characters are used for representing the hundred thousands:

لکھہ INDIC SIYAQ NUMBER LAKH

لکھہان INDIC SIYAQ NUMBER LAKHAN

لک INDIC SIYAQ LAKH MARK

The لکھہ LAKH is derived from the Hindi word लाख *lākh* "one hundred thousand". The لکھہان LAKHAN "two hundred thousand" is formed by adding the Persian dual suffix *-an* to *lakh*: लाखन *lākhan*. The لک LAKH MARK is a contraction of لکھہ LAKH that is used for writing 3 lakh (300,000) to 90 lakh (9,000,000). While these characters may be represented using sequences of their constituent Arabic letters, they are proposed as atomic characters because they possess numerical values that cannot be obtained from sequences.

4.10 Alternate form of the lakh mark

للہ INDIC SIYAQ ALTERNATE LAKH MARK

The للہ ALTERNATE LAKH MARK is used in the Deccani style in place of لک LAKH MARK for writing all multiples of lakh (see figures 9 and 10). The difference between للہ and لک is the absence of the diagonal stroke above the letter ک *kaf* in the former, which is placed across the horizontal stroke instead. The form of the ALTERNATE LAKH MARK may be based upon the use of the Arabic style ك *kaf* in writing لك *lak(h)*, instead of the Urdu ک *kaf*. It is proposed for encoding as a separate character on account of its distinctive usage.

4.11 Crore (tens of million)

The following 2 characters are used for representing crores, or tens of millions:

کرور INDIC SIYAQ NUMBER KAROR

کروراں INDIC SIYAQ NUMBER KARORAN

The کرور KAROR is derived from the Hindi करोड़ *karoṛ* "ten million". The کروراں KARORAN "twenty million" is formed using the same principle as لکھہان LAKHAN. The کرور KAROR is used as a unit mark for 30–90 crores. These characters are encoded atomically because their values cannot be obtained from sequences of their constituent Arabic letters.

4.12 Placeholder

The following character is used for indicating the end of a numeric sequence:

ؕ INDIC SIYAQ PLACEHOLDER

It has the variant form ؕ. The sign is commonly used with numbers that have a horizonal stroke, such as the thousands and ten thousands, when they occur in isolation in order to prevent forgery as the empty space above the horizontal stroke provides an opportunity for the unscrupulous insertion of additional numbers.

4.13 Fractions

There are 3 fraction signs:

- ـ INDIC SIYAQ FRACTION ONE QUARTER
- ـ INDIC SIYAQ FRACTION ONE HALF
- ـ INDIC SIYAQ FRACTION THREE QUARTERS

These fraction signs are rudimentary shapes that resemble existing characters in the Arabic block, such as ٠ U+0660 ARABIC-INDIC DIGIT ZERO and ۰ U+06F0 EXTENDED ARABIC-INDIC DIGIT ZERO, and ۔ U+06D4 ARABIC FULL STOP; as well as generic punctuation such as · U+00B7 MIDDLE DOT and - U+002D HYPHEN-MINUS. However, the semantics of the Indic Siyaq fraction signs differs from those of characters that are visually similar.

4.14 Currency mark

There is 1 currency mark:

- ـ INDIC SIYAQ RUPEE MARK

This RUPEE MARK resembles existing Arabic characters, such as ؍ U+060D ARABIC DATE SIGN, currency signs in other scripts, such as ৴ U+09F4 BENGALI CURRENCY NUMERATOR ONE, and various other characters, such as / U+002F SOLIDUS.

5 Orthography

The manner of representing numbers in Indic Siyaq is described below. The examples contain three columns: the left is the numeric value; the center is the Indic Siyaq representation from right-to-left; the right is the set of characters used for producing the numeric sequence in encoded text. The order of the characters in the right column is left-to-right, but this directionality is intended only to indicate the input sequence of the characters, eg. the left-most character is the first one to be input.

5	ـ	<ـ FIVE>
50	ـ	<ـ FIFTY>
55	ـ	<ـ PREFIXED FIVE, ـ FIFTY>
500	ـ	<ـ FIVE HUNDRED>
505	ـ	<ـ FIVE HUNDRED, ـ FIVE>

510	حماعہ	<حما FIVE HUNDRED, عہ TEN>
515	حماحعہ	<حما FIVE HUNDRED, حـ PREFIXED FIVE, عہ TEN>
5,000	حمـ	<حمـ FIVE THOUSAND>
5,000	حمـّ	<حمـ FIVE THOUSAND, ّ PLACEHOLDER>
5,000	حہ الـ	<حہ FIVE, الـ ONE THOUSAND>
5,005	حمـحہ	<حمـ FIVE THOUSAND, حہ FIVE>
5,100	حمـما	<حمـ FIVE THOUSAND, ما ONE HUNDRED>
50,000	حـ	<حـہ FIFTY THOUSAND>
50,000	حـالـ	<حـ FIFTY THOUSAND, الـ ONE THOUSAND>
50,000	حـّ	<حـ FIFTY THOUSAND, ّ PLACEHOLDER>
50,005	حـحہ	<حـ FIFTY THOUSAND, حہ FIVE>
50,550	حـحما حـہ	<حـ FIFTY THOUSAND, حما FIVE HUNDRED, حـہ FIFTY>
55,000	ححـ	<حـ PREFIXED FIVE, حـ FIFTY THOUSAND>
55,000	ححـالـ	<حـ PREFIXED FIVE, حـ FIFTY THOUSAND, الـ ONE THOUSAND>
55,005	ححـحہ	<حہ PREFIXED FIVE, حـ FIFTY THOUSAND, حہ FIVE>
5,00,000	حہ لک	<حہ FIVE, لک LAKH MARK>
5,00,000	حہ للہ	<حہ FIVE, للہ ALTERNATE LAKH MARK>

Number	Siyaq form	Description
5,05,505	لک	<FIVE, لک LAKH MARK, FIVE THOUSAND, FIVE HUNDRED, FIVE>
5,55,555	لک	<FIVE, لک LAKH MARK, PREFIXED FIVE, FIFTY THOUSAND, FIVE HUNDRED, PREFIXED FIVE, FIFTY>
50,00,000	لک	<FIFTY, لک LAKH MARK>
50,00,000	لک	<FIFTY THOUSAND, لک LAKH MARK>
50,00,000		<FIFTY, ALTERNATE LAKH MARK>
50,00,000		<FIFTY THOUSAND, ALTERNATE LAKH MARK>
55,00,000	لک	<PREFIXED FIVE, FIFTY, لک LAKH MARK>
55,00,000	لک	<PREFIXED FIVE, FIFTY THOUSAND, لک LAKH MARK>
5,00,00,000	کرور	<FIVE, کرور KAROR>
50,00,00,000	کرور	<FIFTY, کرور KAROR>
50,00,00,000	کرور	<FIFTY THOUSAND, کرور KAROR>

5.1 Primary numbers in compound with tens and ten thousands

For primary numbers in compounds containing the tens and ten thousands, the primary unit and the larger number are transposed, with the primary unit placed before the larger number. Below are representations for 11–19. The pattern is the same for 21–99.

Number	Siyaq form	Description
10		<TEN>
11		<PREFIXED ONE, TEN>

12 عـعـــه <عـــ PREFIXED TWO, عـــه TEN>

13 سـعـــه <سـ PREFIXED THREE, عـــه TEN>

14 للوعـــه <للو PREFIXED FOUR, عـــه TEN>

15 حعـــه <حـ PREFIXED FIVE, عـــه TEN>

16 عـــه <ـــ PREFIXED SIX, عـــه TEN>

17 موعـــه <مو PREFIXED SEVEN, عـــه TEN>

18 سعـــه <سـ PREFIXED EIGHT, عـــه TEN>

19 لوعـــه <لو PREFIXED NINE, عـــه TEN>

20 عـــه <عـــه TWENTY>

5.2 Thousands

The thousands are represented using the distinctive character for each number:

1,000 الـــ <الـــ ONE THOUSAND>

2,000 اعـــ <اعـــ TWO THOUSAND>

3,000 سمـــ <سمـــ THREE THOUSAND>

9,000 لعـــ <لعـــ NINE THOUSAND>

When the thousands occur in isolation, the ّ PLACEHOLDER is often written above the stroke:

1,000 الـــّ <الـــ ONE THOUSAND, ّ PLACEHOLDER>

In the Deccani style, the thousands are represented using الـــ ONE THOUSAND as a unit mark, while the primary numbers indicate the appropriate multiple:

1,000 عهم الـــ <عهم ONE, الـــ ONE THOUSAND>

2,000 عها الـــ <عها TWO, الـــ ONE THOUSAND>

3,000 سے الـــ <سے THREE, الـــ ONE THOUSAND>

9,000 لوہ الـــ <لوہ TWO, الـــ ONE THOUSAND>

5.3 Ten thousands

The thousands are represented using the respective character for each number. Multiples are written using prefixed forms of the primary numbers, similar to the pattern for 11–19 described above:

10,000 عـــ <عـــ TEN THOUSAND>

11,000 لہعـــ <لہ PREFIXED ONE, عـــ TEN THOUSAND>

12,000 عہعـــ <عہ PREFIXED TWO, عـــ TEN THOUSAND>

13,000 سہعـــ <سہ PREFIXED THREE, عـــ TEN THOUSAND>

19,000 لوعـــ <لو PREFIXED NINE, عـــ TEN THOUSAND>

20,000 عہـــ <عہـــ TWENTY THOUSAND>

Compounds with عمـــ ALTERNATE TEN THOUSAND are written similarly:

10,000 عمـــ <عمـــ ALTERNATE TEN THOUSAND>

11,000 لہ <لہ PREFIXED ONE, عـــ ALTERNATE TEN THOUSAND>

12,000 عہ <عہ PREFIXED TWO, عـــ ALTERNATE TEN THOUSAND>

13,000 سہ <سہ PREFIXED THREE, عـــ ALTERNATE TEN THOUSAND>

When the ten thousands occur in isolation, the ꣱ PLACEHOLDER is often written above the stroke:

1,000 ꣱عـــ <عـــ TEN THOUSAND, ꣱ PLACEHOLDER>

In the Deccani style, the ten thousands may be represented alternatively using الـــ ONE THOUSAND as a unit mark, while the ten thousands indicate the appropriate multiple:

10,000 عالـــ <عـــ TEN THOUSAND, الـــ ONE THOUSAND>

11,000 لہعالـــ <لہ PREFIXED ONE, عـــ TEN THOUSAND, الـــ ONE THOUSAND>

12,000 عہعالـــ <عہ PREFIXED TWO, عـــ TEN THOUSAND, الـــ ONE THOUSAND>

13,000	سـعـالـ	<سـ PREFIXED THREE, عـ TEN THOUSAND, الـ ONE THOUSAND>
20,000	عـالـ	<عـ TWENTY THOUSAND, الـ ONE THOUSAND>

The horizontal stroke of the ten thousands is often extended beneath all smaller numbers that follow it:

50,550	حـحماحـه	<حـ FIFTY THOUSAND, حما FIVE HUNDRED, حـه FIFTY>
55,550	حـحـحماحـه	<حـ PREFIXED FIVE, حـ FIFTY THOUSAND, حما FIVE HUNDRED, حـه FIFTY>

5.4 Lakhs (hundred thousands)

The numbers 1 and 2 lakhs are represented using distinctive characters, while 3–9 lakhs are represented using the respective primary number followed by the لک LAKH MARK:

1,00,000 (100,000)	لکھہ	<لکھہ LAKH>
2,00,000 (200,000)	لکھان	<لکھان LAKHAN>
3,00,000 (300,000)	سے لک	<سے THREE, لک LAKH MARK>
9,00,000 (900,000)	لوہ لک	<لوہ NINE, لک LAKH MARK>

In the Deccani style, لکھہ LAKH and لکھان LAKHAN are not used. Instead, the للہ ALTERNATE LAKH MARK is used by itself for 1 lakh and in conjunction with the appropriate primary number for all other multiples:

1,00,000 (100,000)	للہ	<للہ ALTERNATE LAKH MARK>
2,00,000 (200,000)	عقا للہ	<عقا TWO, للہ ALTERNATE LAKH MARK>
3,00,000 (300,000)	سے للہ	<سے THREE, للہ ALTERNATE LAKH MARK>
9,00,000 (900,000)	لوہ للہ	<لوہ NINE, للہ ALTERNATE LAKH MARK>

5.5 Tens of lakhs (primary millions)

The tens of lakhs are expressed using the tens and the لک LAKH MARK.

10,00,000 (1,000,000)	عـه لک	<عـه TEN, لک LAKH MARK>
11,00,000 (1,100,000)	لہعـه لک	<لہ PREFIXED ONE, عـه TEN, لک LAKH MARK>
12,00,000 (1,200,000)	عـعـه لک	<عـ PREFIXED TWO, عـ TEN, لک LAKH MARK>
13,00,000 (1,300,000)	سـعـه لک	<سـ PREFIXED THREE, عـ TEN, لک LAKH MARK>
20,00,000 (2,000,000)	عـسـه لک	<عـسـه TWENTY, لک LAKH MARK>

Several sources show a modified form of the tens when these numbers occur with لک LAKH MARK, in which the terminal loop is removed in order to accommodate the placement of the LAKH MARK above the stroke of the tens. In this style, 10 lakh is written as عـلک not as عـه لک. This method of writing the tens of lakhs may be mimicked by using the numbers for the ten thousands, whose shapes resemble the modified tens. While this approach does not preserve the semantic value of the number, it does offer a visual solution. Although a number such as عـلک could be incorrectly read as 'ten thousand lakh' instead of as 'ten lakh', the correct meaning is evident from context.

10,00,000 (1,000,000)	عـلک	<عـ TEN THOUSAND, لک LAKH MARK>
11,00,000 (1,100,000)	لہعـلک	<لہ PREFIXED ONE, عـ TEN THOUSAND, لک LAKH MARK>
12,00,000 (1,200,000)	عـعـلک	<عـ PREFIXED TWO, عـ TEN THOUSAND, لک LAKH MARK>
13,00,000 (1,300,000)	سـعـلک	<سـ PREFIXED THREE, عـ TEN THOUSAND, لک LAKH MARK>
20,00,000 (2,000,000)	عـسـلک	<عـسـ TWENTY THOUSAND, لک LAKH MARK>

Another method might be to produce the alternate display using contextual substitutions in a font.

5.6 Crores (ten millions)

The numbers 1 and 2 crores are represented using distinctive characters, while 3–9 crores are represented using the respective primary number followed by the 𐭊𐭓𐭅𐭓 KAROR:

1,00,00,000 (10,000,000) 𐭊𐭓𐭅𐭓 <𐭊𐭓𐭅𐭓 KAROR>

2,00,00,000 (20,000,000) 𐭊𐭓𐭅𐭓𐭀𐭓 <𐭊𐭓𐭅𐭓𐭀𐭓 KARORAN>

2,00,00,000 (20,000,000) 𐭏𐭐𐭀𐭊𐭓𐭅𐭓 <𐭏𐭐𐭀 TWO, 𐭊𐭓𐭅𐭓 KAROR>

3,00,00,000 (30,000,000) 𐭎𐭉𐭊𐭓𐭅𐭓 <𐭎𐭉 THREE, 𐭊𐭓𐭅𐭓 KAROR>

9,00,00,000 (90,000,000) 𐭍𐭄𐭊𐭓𐭅𐭓 <𐭍𐭄 NINE, 𐭊𐭓𐭅𐭓 KAROR>

5.7 Tens of crores (hundred millions)

The tens of crores are expressed using the tens and 𐭊𐭓𐭅𐭓 KAROR.

10,00,00,000 (100,000,000) 𐭏𐭄 𐭊𐭓𐭅𐭓 <𐭏𐭄 TEN, 𐭊𐭓𐭅𐭓 KAROR>

11,00,00,000 (110,000,000) 𐭍𐭄𐭏𐭄 𐭊𐭓𐭅𐭓 <𐭍𐭄 PREFIXED ONE, 𐭏𐭄 TEN, 𐭊𐭓𐭅𐭓 KAROR>

12,00,00,000 (120,000,000) 𐭏𐭏𐭄 𐭊𐭓𐭅𐭓 <𐭏 PREFIXED TWO, 𐭏𐭄 TEN, 𐭊𐭓𐭅𐭓 KAROR>

19,00,00,000 (190,000,000) 𐭎𐭏𐭄 𐭊𐭓𐭅𐭓 <𐭎 PREFIXED THREE, 𐭏𐭄 TEN, 𐭊𐭓𐭅𐭓 KAROR>

20,00,00,000 (200,000,000) 𐭏𐭄 𐭊𐭓𐭅𐭓 <𐭏𐭄 TWENTY, 𐭊𐭓𐭅𐭓 KAROR>

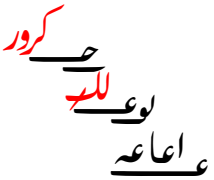
Similar to the alternate orthography for tens of lakhs (see § 5.5), the tens of crores may be written using modified forms of the tens: 10 crore is written as ع کرور not as کرور عہ. As suggested for the tens of lakhs, the numbers for the ten thousands may be used for the tens when writing tens of crores, even though this approach does not presrve the semantic value of the number:

10,00,00,000 (100,000,000)	ع کرور	<ع TEN THOUSAND, کرور KAROR>
11,00,00,000 (110,000,000)	لع کرور	<لہ PREFIXED ONE, ع TEN THOUSAND, کرور KAROR>
12,00,00,000 (120,000,000)	بع کرور	<بہ PREFIXED TWO, ع TEN THOUSAND, کرور KAROR>
19,00,00,000 (190,000,000)	دع کرور	<دہ PREFIXED THREE, ع TEN THOUSAND, کرور KAROR>
20,00,00,000 (200,000,000)	عد کرور	<عد TWENTY THOUSAND, کرور KAROR>

Another method might be to produce the alternate display using contextual substitutions in a font.

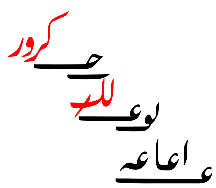
5.8 Alternate method of writing lakhs and crores

As shown in figures 10–14, an alternate method of writing lakhs and crores is used in the Deccani style. Instead of the logical left-to-right order, the individual units of a number are positioned in inverse vertical order, such that the smallest number is written first with larger units ascending upwards and leftwards.

	Logical	Inverted
1,50,568	حمالیہ للہ	
56,19,10,401	ع اعاعہ لوع للہ حع کرور	

The two orientations would need to be encoded using different character sequences. For example, the encoded sequences for the number 56,19,10,401 shown above are:

<ــــ PREFIXED SIX, حــہ FIFTY, کرور KAROR
لو PREFIXED NINE, عــہ TEN, للہ ALTERNATE LAKH MARK
عــــ TEN THOUSAND, اعا FOUR HUNDRED, عہ ALTERNATE ONE>



<عــــ TEN THOUSAND, اعا FOUR HUNDRED, عہ ALTERNATE ONE>
لو PREFIXED NINE, عــہ TEN, للہ ALTERNATE LAKH MARK
ــــ PREFIXED SIX, حــہ FIFTY, کرور KAROR>

Note the rendering of the tens with ALTERNATE LAKH MARK and KAROR using modified forms resembling the ten thousands.

5.9 Fractions

Fraction signs are placed after a number:

5¼	حہ ـ	<حہ FIVE, ـ FRACTION ONE QUARTER>
5½	حہ ٠	<حہ FIVE, ٠ FRACTION ONE HALF>
5⅓	حہ ـٔ	<حہ FIVE, ـٔ FRACTION THREE QUARTERS>

5.10 Currency

Currency in Indic Siyaq is counted in terms of the historical rupee, which was used before 1950 (see Pandey 2007 for a description of regional currency notation systems and the characters used for representing them in various Indic scripts).

The روپیہ *rūpaya* (English sg. 'rupee', pl. 'rupees', abbreviated 'Rs.') and whole Rs. are represented using Siyaq numbers and are denoted using the INDIC SIYAQ RUPEE MARK:

Rs. 10	عــہ/	<عــہ TEN, / RUPEE MARK>
Rs. 100	ما/	<ما ONE HUNDRED, / RUPEE MARK>
Rs. 1,000	الـــ/	<الـــ ONE THOUSAND, / RUPEE MARK>
Rs. 1,000	الـــٚ/	<الـــ ONE THOUSAND, ٚ PLACEHOLDER, / RUPEE MARK>

The historical rupee is divided into 16 آنہ *ānā* (English 'anna', abbreviated 'As.'). The As. are written using Arabic-Indic digits, followed by the ⁄ RUPEE MARK when the unit occurs in isolation. When Rs. and As. are written together, they are separated by the RUPEE MARK, with the As. positioned to the left of the mark:

As. 1	⁄۱	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ⁄ RUPEE MARK>
As. 2	⁄۲	<۲ U+06F2 EXTENDED ARABIC-INDIC DIGIT TWO, ⁄ RUPEE MARK>
As. 3	⁄۳	<۳ U+06F3 EXTENDED ARABIC-INDIC DIGIT THREE, ⁄ RUPEE MARK>
As. 14	⁄۱۴	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ۴ U+06F4 EXTENDED ARABIC-INDIC DIGIT FOUR, ⁄ RUPEE MARK>
As. 15	⁄۱۵	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ۵ U+06F5 EXTENDED ARABIC-INDIC DIGIT FIVE, ⁄ RUPEE MARK>
Rs. 1	عصم⁄	<عصم ONE, ⁄ RUPEE MARK>
Rs. 1, As. 1	عصم⁄۱	<عصم ONE, ⁄ RUPEE MARK, ۱ U+0661 EXTENDED ARABIC-INDIC DIGIT ONE>
Rs. 1, As. 2	عصم⁄۲	<عصم ONE, ⁄ RUPEE MARK, ۲ U+0662 EXTENDED ARABIC-INDIC DIGIT TWO>

The As. is divided into 12 پائی *pāī* ('pie', plural 'pies' or 'pice', abbreviated 'P'). The P. is written using Arabic-Indic digits, which are placed to the left of the RUPEE MARK when the unit is written in isolation. When As. and P. are written together, they are separated by the RUPEE MARK, with the P. written to the left of the currency sign:

P. 1	۱⁄	<⁄ RUPEE MARK, ۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE>
P. 2	۲⁄	<⁄ RUPEE MARK, ۲ U+06F2 EXTENDED ARABIC-INDIC DIGIT TWO>
P. 3	۳⁄	<⁄ RUPEE MARK, ۳ U+06F3 EXTENDED ARABIC-INDIC DIGIT THREE>
P. 10	۱۰⁄	<⁄ RUPEE MARK, ۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ۰ U+06F0 EXTENDED ARABIC-INDIC DIGIT ZERO>
P. 11	۱۱⁄	<⁄ RUPEE MARK, ۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE>
As. 1	⁄۱	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ⁄ RUPEE MARK>
As. 1, P. 1	۱⁄۱	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, ⁄ RUPEE MARK, ۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE>

As. 1, P. 2	۱/۲	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, / RUPEE MARK, ۲ U+06F2 EXTENDED ARABIC-INDIC DIGIT TWO>

Additionally, as shown in figure 7, the word پائی itself may be written after the quantity:

الـــّ ماحعـــه ۱۱/۸٠/ پائی   Rs. 1125, As. 11, Pai 8½

Additionally, the P. is grouped into units called پیسا *paisā* (sg. 'paisa', pl. 'paise', abbreviated 'Ps'). Three P. constitute one Ps. Four Ps. make one As. The Ps. is represented using fraction signs:

Ps. 1	−/	<− FRACTION ONE QUARTER, / RUPEE MARK>
Ps. 2	٠/	<٠ FRACTION ONE HALF, / RUPEE MARK>
Ps. 3	ـٔ/	<ـٔ FRACTION THREE QUARTERS, / RUPEE MARK>
As. 1	۱/	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, / RUPEE MARK>
As. 1, Ps. 1	۱−/	<۱ U+06F1 EXTENDED ARABIC-INDIC DIGIT ONE, − FRACTION ONE QUARTER, / RUPEE MARK>

When currency values less than 1 rupee are written with larger values, then the sequence of characters denoting the former are positioned beneath the latter.

الـــّ ماحعـــه   Rs. 1125, As. 11, Pai 8½
۱۱/۸٠/

The below-base positioning of the smaller currency units is to be handled through layout. The default representation is linear:

الـــّ ماحعـــه ۱۱/۸٠/

6 Character Data

Character Properties In the format of `UnicodeData.txt`:

```
1EC71;INDIC SIYAQ NUMBER ONE;No;0;AL;;;;1;N;;;;;
1EC72;INDIC SIYAQ NUMBER TWO;No;0;AL;;;;2;N;;;;;
1EC73;INDIC SIYAQ NUMBER THREE;No;0;AL;;;;3;N;;;;;
1EC74;INDIC SIYAQ NUMBER FOUR;No;0;AL;;;;4;N;;;;;
1EC75;INDIC SIYAQ NUMBER FIVE;No;0;AL;;;;5;N;;;;;
1EC76;INDIC SIYAQ NUMBER SIX;No;0;AL;;;;6;N;;;;;
1EC77;INDIC SIYAQ NUMBER SEVEN;No;0;AL;;;;7;N;;;;;
1EC78;INDIC SIYAQ NUMBER EIGHT;No;0;AL;;;;8;N;;;;;
1EC79;INDIC SIYAQ NUMBER NINE;No;0;AL;;;;9;N;;;;;
```

```
1EC7A;INDIC SIYAQ NUMBER TEN;No;0;AL;;;;10;N;;;;;
1EC7B;INDIC SIYAQ NUMBER TWENTY;No;0;AL;;;;20;N;;;;;
1EC7C;INDIC SIYAQ NUMBER THIRTY;No;0;AL;;;;30;N;;;;;
1EC7D;INDIC SIYAQ NUMBER FORTY;No;0;AL;;;;40;N;;;;;
1EC7E;INDIC SIYAQ NUMBER FIFTY;No;0;AL;;;;50;N;;;;;
1EC7F;INDIC SIYAQ NUMBER SIXTY;No;0;AL;;;;60;N;;;;;
1EC80;INDIC SIYAQ NUMBER SEVENTY;No;0;AL;;;;70;N;;;;;
1EC81;INDIC SIYAQ NUMBER EIGHTY;No;0;AL;;;;80;N;;;;;
1EC82;INDIC SIYAQ NUMBER NINETY;No;0;AL;;;;90;N;;;;;
1EC83;INDIC SIYAQ NUMBER ONE HUNDRED;No;0;AL;;;;100;N;;;;;
1EC84;INDIC SIYAQ NUMBER TWO HUNDRED;No;0;AL;;;;200;N;;;;;
1EC85;INDIC SIYAQ NUMBER THREE HUNDRED;No;0;AL;;;;300;N;;;;;
1EC86;INDIC SIYAQ NUMBER FOUR HUNDRED;No;0;AL;;;;400;N;;;;;
1EC87;INDIC SIYAQ NUMBER FIVE HUNDRED;No;0;AL;;;;500;N;;;;;
1EC88;INDIC SIYAQ NUMBER SIX HUNDRED;No;0;AL;;;;600;N;;;;;
1EC89;INDIC SIYAQ NUMBER SEVEN HUNDRED;No;0;AL;;;;700;N;;;;;
1EC8A;INDIC SIYAQ NUMBER EIGHT HUNDRED;No;0;AL;;;;800;N;;;;;
1EC8B;INDIC SIYAQ NUMBER NINE HUNDRED;No;0;AL;;;;900;N;;;;;
1EC8C;INDIC SIYAQ NUMBER ONE THOUSAND;No;0;AL;;;;1000;N;;;;;
1EC8D;INDIC SIYAQ NUMBER TWO THOUSAND;No;0;AL;;;;2000;N;;;;;
1EC8E;INDIC SIYAQ NUMBER THREE THOUSAND;No;0;AL;;;;3000;N;;;;;
1EC8F;INDIC SIYAQ NUMBER FOUR THOUSAND;No;0;AL;;;;4000;N;;;;;
1EC90;INDIC SIYAQ NUMBER FIVE THOUSAND;No;0;AL;;;;5000;N;;;;;
1EC91;INDIC SIYAQ NUMBER SIX THOUSAND;No;0;AL;;;;6000;N;;;;;
1EC92;INDIC SIYAQ NUMBER SEVEN THOUSAND;No;0;AL;;;;7000;N;;;;;
1EC93;INDIC SIYAQ NUMBER EIGHT THOUSAND;No;0;AL;;;;8000;N;;;;;
1EC94;INDIC SIYAQ NUMBER NINE THOUSAND;No;0;AL;;;;9000;N;;;;;
1EC95;INDIC SIYAQ NUMBER TEN THOUSAND;No;0;AL;;;;10000;N;;;;;
1EC96;INDIC SIYAQ NUMBER TWENTY THOUSAND;No;0;AL;;;;20000;N;;;;;
1EC97;INDIC SIYAQ NUMBER THIRTY THOUSAND;No;0;AL;;;;30000;N;;;;;
1EC98;INDIC SIYAQ NUMBER FORTY THOUSAND;No;0;AL;;;;40000;N;;;;;
1EC99;INDIC SIYAQ NUMBER FIFTY THOUSAND;No;0;AL;;;;50000;N;;;;;
1EC9A;INDIC SIYAQ NUMBER SIXTY THOUSAND;No;0;AL;;;;60000;N;;;;;
1EC9B;INDIC SIYAQ NUMBER SEVENTY THOUSAND;No;0;AL;;;;70000;N;;;;;
1EC9C;INDIC SIYAQ NUMBER EIGHTY THOUSAND;No;0;AL;;;;80000;N;;;;;
1EC9D;INDIC SIYAQ NUMBER NINETY THOUSAND;No;0;AL;;;;90000;N;;;;;
1EC9E;INDIC SIYAQ NUMBER LAKH;No;0;AL;;;;100000;N;;;;;
1EC9F;INDIC SIYAQ NUMBER LAKHAN;No;0;AL;;;;200000;N;;;;;
1ECA0;INDIC SIYAQ LAKH MARK;No;0;AL;;;;100000;N;;;;;
1ECA1;INDIC SIYAQ NUMBER KAROR;No;0;AL;;;;1000000;N;;;;;
1ECA2;INDIC SIYAQ NUMBER KARORAN;No;0;AL;;;;20000000;N;;;;;
1ECA3;INDIC SIYAQ NUMBER PREFIXED ONE;No;0;AL;;;;1;N;;;;;
1ECA4;INDIC SIYAQ NUMBER PREFIXED TWO;No;0;AL;;;;2;N;;;;;
1ECA5;INDIC SIYAQ NUMBER PREFIXED THREE;No;0;AL;;;;3;N;;;;;
1ECA6;INDIC SIYAQ NUMBER PREFIXED FOUR;No;0;AL;;;;4;N;;;;;
1ECA7;INDIC SIYAQ NUMBER PREFIXED FIVE;No;0;AL;;;;5;N;;;;;
1ECA8;INDIC SIYAQ NUMBER PREFIXED SIX;No;0;AL;;;;6;N;;;;;
1ECA9;INDIC SIYAQ NUMBER PREFIXED SEVEN;No;0;AL;;;;7;N;;;;;
1ECAA;INDIC SIYAQ NUMBER PREFIXED EIGHT;No;0;AL;;;;8;N;;;;;
1ECAB;INDIC SIYAQ NUMBER PREFIXED NINE;No;0;AL;;;;9;N;;;;;
1ECAC;INDIC SIYAQ PLACEHOLDER;So;0;AL;;;;;N;;;;;
1ECAD;INDIC SIYAQ FRACTION ONE QUARTER;No;0;AL;;;;1/4;N;;;;;
1ECAE;INDIC SIYAQ FRACTION ONE HALF;No;0;AL;;;;1/2;N;;;;;
1ECAF;INDIC SIYAQ FRACTION THREE QUARTERS;No;0;AL;;;;3/4;N;;;;;
1ECB0;INDIC SIYAQ RUPEE MARK;Sc;0;AL;;;;;N;;;;;
1ECB1;INDIC SIYAQ NUMBER ALTERNATE ONE;No;0;AL;;;;1;N;;;;;
1ECB2;INDIC SIYAQ NUMBER ALTERNATE TWO;No;0;AL;;;;2;N;;;;;
1ECB3;INDIC SIYAQ NUMBER ALTERNATE TEN THOUSAND;No;0;AL;;;;10000;N;;;;;
1ECB4;INDIC SIYAQ NUMBER ALTERNATE LAKH MARK;No;0;AL;;;;100000;N;;;;;
```

Linebreaking In the format of `LineBreak.txt`:

```
1CE71..1ECAB;AL  # No  [60] INDIC SIYAQ NUMBER ONE .. NUMBER PREFIXED NINE
1ECAC;PO         # Po       INDIC SIYAQ PLACEHOLDER
1ECAD..1ECAF;AL  # No   [3] INDIC SIYAQ FRACTION ONE QUARTER .. FRACTION THREE QUARTERS
1ECB0;PO         # Sc       INDIC SIYAQ RUPEE MARK
1ECB1..1ECB4;AL  # No   [4] INDIC SIYAQ NUMBER ALTERNATE ONE .. ALTERNATE LAKH MARK
```

Confusion Data Arabic sequences that may mimic Indic Siyaq Numbers are given below:

```
Indic Siyaq Numbers               Arabic
-------------------------------------------------------------------------------
NUMBER ONE                       ; AIN, DOTLESS BEH, SAD
NUMBER TWO                       ; AIN, DOTLESS BEH, SAD, ALEF
NUMBER THREE                     ; DOTLESS BEH, DOTLESS BEH, YEH BARREE
NUMBER FOUR                      ; LAM, LAM, AIN
NUMBER FIVE                      ; SAD, HEH GOAL
NUMBER SIX                       ; LAM, YEH BARREE
NUMBER SEVEN                     ; HEH GOAL, AIN
NUMBER EIGHT                     ; HEH GOAL, YEH BARREE
NUMBER NINE                      ; LAM, AIN
NUMBER TEN                       ; AIN, NOON GHUNNA
NUMBER TWENTY                    ; AIN, DOTLESS BEH, NOON GHUNNA
NUMBER THIRTY                    ; DOTLESS BEH, DOTLESS BEH, NOON GHUNNA
NUMBER FORTY                     ; LAM, LAM, AIN, NOON GHUNNA
NUMBER FIFTY                     ; SAD, NOON GHUNNA
NUMBER SIXTY                     ; TATWEEL, NOON GHUNNA
NUMBER SEVENTY                   ; HEH GOAL, AIN, NOON GHUNNA
NUMBER EIGHTY                    ; LAM, NOON GHUNNA
NUMBER NINETY                    ; LAM, AIN, NOON GHUNNA
NUMBER ONE HUNDRED               ; MEEM, ALEF
NUMBER TWO HUNDRED               ; MEEM, ALEF, LAM, HEH GOAL
NUMBER THREE HUNDRED             ; SEEN, MEEM, ALEF
NUMBER FOUR HUNDRED              ; ALEF, AIN, MEEM, ALEF
NUMBER FIVE HUNDRED              ; SAD, MEEM, ALEF
NUMBER SIX HUNDRED               ; SEEN, TATWEEL, MEEM, ALEF
NUMBER SEVEN HUNDRED             ; LAM, MEEM, ALEF
NUMBER EIGHT HUNDRED             ; LAM, MEEM, ALEF
NUMBER NINE HUNDRED              ; LAAM, AIN, MEEM, ALEF
NUMBER ONE THOUSAND              ; ALEF, LAM, TATWEEL
NUMBER TWO THOUSAND              ; AIN, DOTLESS BEH, TATWEEL
NUMBER THREE THOUSAND            ; DOTLESS BEH, DOTLESS BEH, TATWEEL
NUMBER FOUR THOUSAND             ; LAM, LAM, AIN, TATWEEL
NUMBER FIVE THOUSAND             ; SAD, TATWEEL
NUMBER SIX THOUSAND              ; SEEN, TATWEEL
NUMBER SEVEN THOUSAND            ; HEH GOAL, AIN, TATWEEL
NUMBER EIGHT THOUSAND            ; HEH GOAL, TATWEEL
NUMBER NINE THOUSAND             ; LAM, AIN, TATWEEL
NUMBER TEN THOUSAND              ; AIN, TATWEEL
NUMBER TWENTY THOUSAND           ; AIN, DOTLESS BEH, TATWEEL
NUMBER THIRTY THOUSAND           ; DOTLESS BEH, DOTLESS BEH, TATWEEL
NUMBER FORTY THOUSAND            ; LAM, LAM, AIN, TATWEEL
NUMBER FIFTY THOUSAND            ; SAD, TATWEEL
NUMBER SIXTY THOUSAND            ; SEEN, TATWEEL
NUMBER SEVENTY THOUSAND          ; HEH GOAL, AIN, TATWEEL
NUMBER EIGHTY THOUSAND           ; HEH GOAL, TATWEEL
NUMBER NINETY THOUSAND           ; LAM, AIN, TATWEEL
NUMBER ONE HUNDRED THOUSAND      ; LAM, LAM, TATWEEL
NUMBER LAKH                      ; LAM, KEHEH, HEH GOAL
NUMBER LAKHAN                    ; LAM, KEHEH, HEH GOAL, ALEF, NOON
```

```
LAKH MARK                       ; LAM, KEHEH
NUMBER KAROR                    ; KEHEH, REH, WAW, REH
NUMBER KARORAN                  ; KEHEH, REH, WAW, REH, ALEF, NOON
NUMBER PREFIXED ONE             ; LAM, HEH GOAL
NUMBER PREFIXED TWO             ; AIN, TATWEEL
NUMBER PREFIXED THREE           ; DOTLESS BEH, DOTLESS BEH, TATWEEL
NUMBER PREFIXED FOUR            ; LAM, LAM, AIN, TATWEEL
NUMBER PREFIXED FIVE            ; SAD, TATWEEL
NUMBER PREFIXED SIX             ; SEEN, TATWEEL
NUMBER PREFIXED SEVEN           ; HEH GOAL, AIN, TATWEEL
NUMBER PREFIXED EIGHT           ; HEH GOAL, TATWEEL
NUMBER PREFIXED NINE            ; LAM, AIN, TATWEEL
PLACEHOLDER                     ; SHADDA
FRACTION ONE QUARTER            ; FULL STOP
FRACTION ONE HALF               ; EXTENDED ARABIC-INDIC DIGIT ZERO
FRACTION THREE QUARTERS         ; FULL STOP, EXTENDED ARABIC-INDIC DIGIT ZERO
RUPEE MARK                      ; DATE SEPARATOR
NUMBER ALTERNATE ONE            ; AIN, HEH GOAL
NUMBER ALTERNATE TWO            ; AIN, ALEF
NUMBER ALTERNATE TEN THOUSAND   ; AIN, MEEM, TATWEEL
NUMBER ALTERNATE LAKH MARK      ; LAM, KAF
```

7 References

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8 Acknowledgments

I am extremely grateful to Roozbeh Pournader (Google) for his detailed comments over the years regarding the encoding of the four Siyaq blocks. This proposal certainly would not be possible without his input. I also thank Brian Spooner (University of Pennsylvania) for providing me with a copy of *Siyāq-i Dakkan* and for reviewing this proposal. Rizwan Ahmad (Qatar University), who read through Siyaq charts with me in Ann Arbor in 2007 in my effort to learn the notation system. Rezwan Rezack (Bangalore) provided specimens of bank notes from Hyderabad State. Chander Shekhar (Department of Persian, Delhi University) also reviewed the proposal and provided comments regarding the shapes of glyphs. I am also thankful to the various shopkeepers in Alambagh, Aminabad, Chowk, and Hazratganz in Lucknow, as well as Daryaganj in Delhi, who indulged me when I approached them over the years with drafts of this proposal in hand, asking if they were familiar with these numbers.

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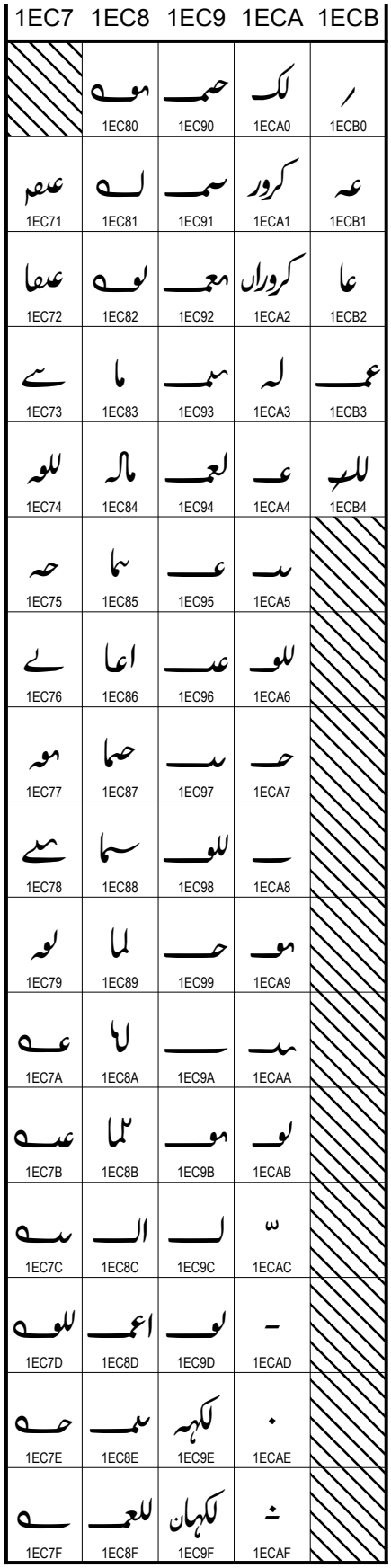


	1EC7	1EC8	1EC9	1ECA	1ECB
0		1EC80	1EC90	1ECA0	1ECB0
1	1EC71	1EC81	1EC91	1ECA1	1ECB1
2	1EC72	1EC82	1EC92	1ECA2	1ECB2
3	1EC73	1EC83	1EC93	1ECA3	1ECB3
4	1EC74	1EC84	1EC94	1ECA4	1ECB4
5	1EC75	1EC85	1EC95	1ECA5	
6	1EC76	1EC86	1EC96	1ECA6	
7	1EC77	1EC87	1EC97	1ECA7	
8	1EC78	1EC88	1EC98	1ECA8	
9	1EC79	1EC89	1EC99	1ECA9	
A	1EC7A	1EC8A	1EC9A	1ECAA	
B	1EC7B	1EC8B	1EC9B	1ECAB	
C	1EC7C	1EC8C	1EC9C	1ECAC	
D	1EC7D	1EC8D	1EC9D	1ECAD	
E	1EC7E	1EC8E	1EC9E	1ECAE	
F	1EC7F	1EC8F	1EC9F	1ECAF	

The Indic Siyaq Numbers are also known as 'Raqm' or 'Rakam' numbers.

Primary numbers

1EC71 ؏ INDIC SIYAQ NUMBER ONE
1EC72 ؏ا INDIC SIYAQ NUMBER TWO
1EC73 ؏ے INDIC SIYAQ NUMBER THREE
1EC74 ؏ھ INDIC SIYAQ NUMBER FOUR
1EC75 ؏ہ INDIC SIYAQ NUMBER FIVE
1EC76 ؏ے INDIC SIYAQ NUMBER SIX
1EC77 ؏ھ INDIC SIYAQ NUMBER SEVEN
1EC78 ؏ے INDIC SIYAQ NUMBER EIGHT
1EC79 ؏ھ INDIC SIYAQ NUMBER NINE

Tens

1EC7A ؏ـہ INDIC SIYAQ NUMBER TEN
1EC7B ؏ـہ INDIC SIYAQ NUMBER TWENTY
1EC7C ؏ـہ INDIC SIYAQ NUMBER THIRTY
1EC7D ؏ـھ INDIC SIYAQ NUMBER FORTY
1EC7E ؏ـہ INDIC SIYAQ NUMBER FIFTY
1EC7F ؏ـے INDIC SIYAQ NUMBER SIXTY
1EC80 ؏ـھ INDIC SIYAQ NUMBER SEVENTY
1EC81 ؏ـے INDIC SIYAQ NUMBER EIGHTY
1EC82 ؏ـھ INDIC SIYAQ NUMBER NINETY

Hundreds

1EC83 ؏ا INDIC SIYAQ NUMBER ONE HUNDRED
1EC84 ؏ال INDIC SIYAQ NUMBER TWO HUNDRED
1EC85 ؏ا INDIC SIYAQ NUMBER THREE HUNDRED
1EC86 ؏ا INDIC SIYAQ NUMBER FOUR HUNDRED
1EC87 ؏ا INDIC SIYAQ NUMBER FIVE HUNDRED
1EC88 ؏ا INDIC SIYAQ NUMBER SIX HUNDRED
1EC89 ؏ا INDIC SIYAQ NUMBER SEVEN HUNDRED
1EC8A ؏ا INDIC SIYAQ NUMBER EIGHT HUNDRED
1EC8B ؏ا INDIC SIYAQ NUMBER NINE HUNDRED

Thousands

1EC8C ؏ـــ INDIC SIYAQ NUMBER ONE THOUSAND
1EC8D ؏ـــ INDIC SIYAQ NUMBER TWO THOUSAND
1EC8E ؏ـــ INDIC SIYAQ NUMBER THREE THOUSAND
1EC8F ؏ـــ INDIC SIYAQ NUMBER FOUR THOUSAND
1EC90 ؏ـــ INDIC SIYAQ NUMBER FIVE THOUSAND
1EC91 ؏ـــ INDIC SIYAQ NUMBER SIX THOUSAND
1EC92 ؏ـــ INDIC SIYAQ NUMBER SEVEN THOUSAND
1EC93 ؏ـــ INDIC SIYAQ NUMBER EIGHT THOUSAND
1EC94 ؏ـــ INDIC SIYAQ NUMBER NINE THOUSAND

Ten thousands

Also used for representing the tens when writing tens of lakhs and tens of crores

1EC95 ؏ـــ INDIC SIYAQ NUMBER TEN THOUSAND
1EC96 ؏ـــ INDIC SIYAQ NUMBER TWENTY THOUSAND
1EC97 ؏ـــ INDIC SIYAQ NUMBER THIRTY THOUSAND
1EC98 ؏ـــ INDIC SIYAQ NUMBER FORTY THOUSAND
1EC99 ؏ـــ INDIC SIYAQ NUMBER FIFTY THOUSAND
1EC9A ؏ـــ INDIC SIYAQ NUMBER SIXTY THOUSAND
1EC9B ؏ـــ INDIC SIYAQ NUMBER SEVENTY THOUSAND
1EC9C ؏ـــ INDIC SIYAQ NUMBER EIGHTY THOUSAND
1EC9D ؏ـــ INDIC SIYAQ NUMBER NINETY THOUSAND

Lakhs

Used for the hundred thousands and primary millions

1EC9E ؏ـہ INDIC SIYAQ NUMBER LAKH
= 1 lakh
= 100,000

1EC9F ؏ـہاں INDIC SIYAQ NUMBER LAKHAN
= 2 lakh
= 200,000

1ECA0 ؏ـک INDIC SIYAQ LAKH MARK
• used as a mark for denoting other lakh values

Crores

Used for the ten millions and higher orders

1ECA1 ؏ـکرور INDIC SIYAQ NUMBER KAROR
= 1 crore
= 10 million
= 100 lakh
• used as a mark for denoting crores

1ECA2 ؏ـکروڑاں INDIC SIYAQ NUMBER KARORAN
= 2 crore
= 20 million
= 200 lakh

Prefixed forms of primary numbers

Used for representing primary units in compounds

1ECA3 ـ؏ INDIC SIYAQ NUMBER PREFIXED ONE
1ECA4 ـ؏ INDIC SIYAQ NUMBER PREFIXED TWO
1ECA5 ـ؏ INDIC SIYAQ NUMBER PREFIXED THREE
1ECA6 ـ؏ INDIC SIYAQ NUMBER PREFIXED FOUR
1ECA7 ـ؏ INDIC SIYAQ NUMBER PREFIXED FIVE
1ECA8 ـ؏ INDIC SIYAQ NUMBER PREFIXED SIX
1ECA9 ـ؏ INDIC SIYAQ NUMBER PREFIXED SEVEN
1ECAA ـ؏ INDIC SIYAQ NUMBER PREFIXED EIGHT
1ECAB ـ؏ INDIC SIYAQ NUMBER PREFIXED NINE

Placeholder

1ECAC ؏ INDIC SIYAQ PLACEHOLDER

Fractions

1ECAD ؏ INDIC SIYAQ FRACTION ONE QUARTER
1ECAE ؏ INDIC SIYAQ FRACTION ONE HALF
1ECAF ؏ INDIC SIYAQ FRACTION THREE QUARTERS

Currency sign

1ECB0 ؏ INDIC SIYAQ RUPEE MARK

Alternate forms

1ECB1 ؏ INDIC SIYAQ NUMBER ALTERNATE ONE
1ECB2 ؏ INDIC SIYAQ NUMBER ALTERNATE TWO
1ECB3 ؏ـــ INDIC SIYAQ NUMBER ALTERNATE TEN THOUSAND
1ECB4 ؏ـہ INDIC SIYAQ ALTERNATE LAKH MARK

	*x*1	*x*10	*x*100	*x*1,000	*x*10,000	*x*100,000	*x*1,000,000	*x*10,000,000
1	𞱱	𞱺	𞲃	𞲌	𞲕	𞲞	𞱺𞲠	𞲡
2	𞱲	𞱻	𞲄	𞲍	𞲖	𞲟	𞱻𞲠	𞲢
3	𞱳	𞱼	𞲅	𞲎	𞲗	𞲥 𞲠	𞱼𞲠	𞲥 𞲡
4	𞱴	𞱽	𞲆	𞲏	𞲘	𞲦 𞲠	𞱽𞲠	𞲦 𞲡
5	𞱵	𞱾	𞲇	𞲐	𞲙	𞲧 𞲠	𞱾𞲠	𞲧 𞲡
6	𞱶	𞱿	𞲈	𞲑	𞲚	𞲨 𞲠	𞱿𞲠	𞲨 𞲡
7	𞱷	𞲀	𞲉	𞲒	𞲛	𞲩 𞲠	𞲀𞲠	𞲩 𞲡
8	𞱸	𞲁	𞲊	𞲓	𞲜	𞲪 𞲠	𞲁𞲠	𞲪 𞲡
9	𞱹	𞲂	𞲋	𞲔	𞲝	𞲫 𞲠	𞲂𞲠	𞲫 𞲡

Table 1: Indic forms of the Siyaq numbers for eight decimal orders.

RAQAM.

This is the method universally employed by nations using the Arabic character for recording pecuniary transactions, and for noting all computations of weight and measure. The word *raqam* denotes "marking," "noting," "writing," and is used for the "price-mark" placed on an article to express its value. The symbols themselves are merely abbreviations of the Arabic words denoting numbers; and, notwithstanding their apparent complexity, are exceedingly simple when their characteristic features are recognized. The *raqam* symbols from 1 to 10 are abbreviations of the Arabic words. Thus 1 is expressed by عدد "number," with a final stroke implying "unity"; 2 is represented by the dual form عددان; 3 is ثلثه; 4 is ربع; 5 is خمس; 6 is ستة; 7 is سبع; 8 is ثماني; 9 is تسع; 10 is عشره. As the symbols are Shikasta forms of these words they are written from right to left; and the initial of each is its characteristic feature. In forming the symbols from 11 to 19, the representative of 10 is written with the characteristic feature of each unit running out into a streak underneath. These symbols, therefore, may be read as 10+1, 10+2, 10+3, &c. The figure 20 is represented by the characteristic feature of 2 prefixed to the finial of the symbol for 10, and thus simply enough indicates "double ten." The units are placed under this, as before, to express "double 10+1," up to "double 10+9." The characteristic features of 3, 4, 5, 6, 7, 8, and 9, are prefixed to the finial of 10, to render the numbers 30, 40, 50, &c.; and the units are run under each, as before explained, to express the intermediate numbers, up to 99. The figure 100 is an abbreviation of the Arabic مائه; and the same process of prefixing the characteristic features of the units, carries us up to 900. These symbols are placed at the right-hand side of the lesser numbers; thus 123 would be written $\frac{20}{3}$.100. The symbol for 1000 is the Arabic word الف; and the usual modifications of its initial part carry the numeration up to 90,000. The representatives of thousands are placed to the right of those representing hundreds; thus, 1125 would appear as $\frac{20}{5}$.100.1000. To express numbers beyond 90,000 the Indian words لكهه or لاكهه 100,000, and كڑور 10,000,000 have been availed of. The word لكهه is not used alone, but has the figure 1 prefixed, indicating "one lakh"; for 2 lakhs a dual form is improvised, and لكهان is made to express "double lakh." To render 3 lakhs up to 90 lakhs, first the units, and, in this case, the tens also are run under the primary symbol, until we reach 1 *karor*, and its dual *karorán*, "2 karors," after which the former process is repeated, if such high numbers are ever required.

It is hoped that the foregoing explanation will simplify what appears to many Europeans to be a puzzling system of notation. A complete table of *raqam* figures is here added.

Figure 1: Description of Siyaq notation (from Palmer 1886: 39, 40). The table of *raqam* referred to in the last paragraph is the same as that given by Stewart (1825), shown here in figure 6.

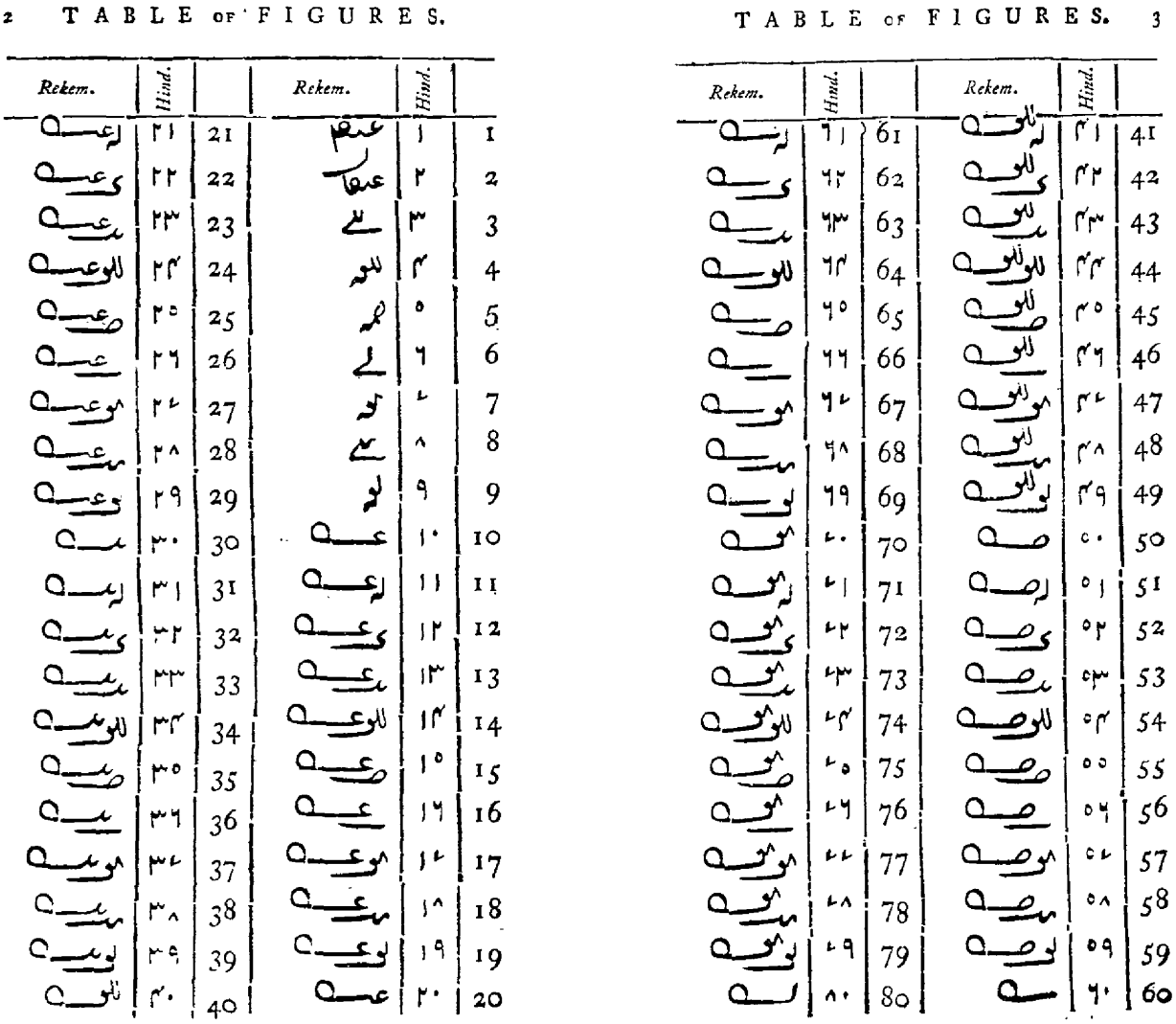
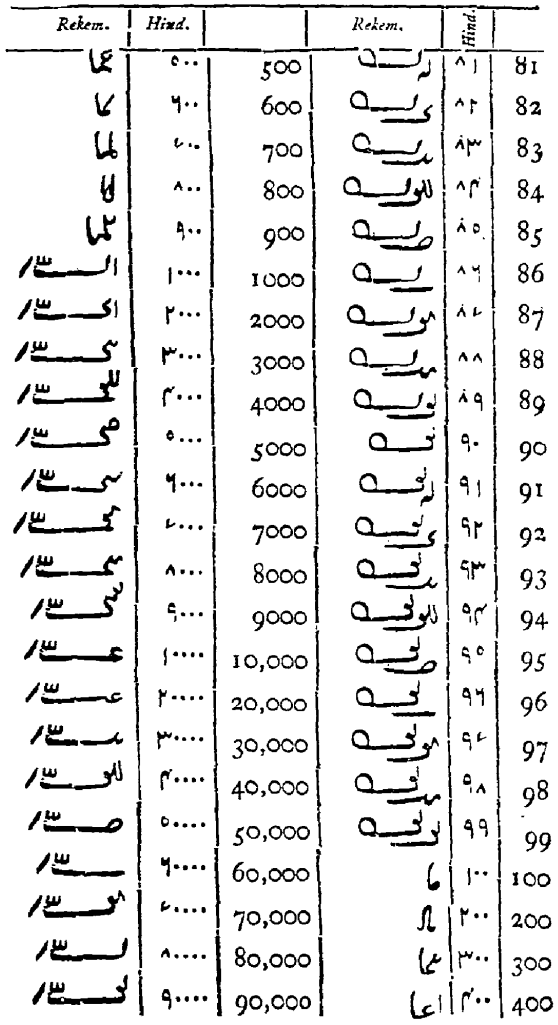


Figure 2: Printed forms of Indic Siyaq Numbers (from Gladwin 1790: 2, 3).



4 TABLE of FIGURES.

Rekem.	Hind.		Rekem.	Hind.	
	٥٠٠	500		٨١	81
	٦٠٠	600		٨٢	82
	٧٠٠	700		٨٣	83
	٨٠٠	800		٨٤	84
	٩٠٠	900		٨٥	85
١/	١٠٠٠	1000		٨٦	86
٢/	٢٠٠٠	2000		٨٧	87
٣/	٣٠٠٠	3000		٨٨	88
٤/	٤٠٠٠	4000		٨٩	89
٥/	٥٠٠٠	5000		٩٠	90
٦/	٦٠٠٠	6000		٩١	91
٧/	٧٠٠٠	7000		٩٢	92
٨/	٨٠٠٠	8000		٩٣	93
٩/	٩٠٠٠	9000		٩٤	94
١٠/	١٠٠٠٠	10,000		٩٥	95
٢٠/	٢٠٠٠٠	20,000		٩٦	96
٣٠/	٣٠٠٠٠	30,000		٩٧	97
٤٠/	٤٠٠٠٠	40,000		٩٨	98
٥٠/	٥٠٠٠٠	50,000		٩٩	99
٦٠/	٦٠٠٠٠	60,000		١٠٠	100
٧٠/	٧٠٠٠٠	70,000		٢٠٠	200
٨٠/	٨٠٠٠٠	80,000		٣٠٠	300
٩٠/	٩٠٠٠٠	90,000		٤٠٠	400

Figure 3: Metal types showing forms of the ten thousands that are elongations of the alternate forms for the primary numbers (from Gladwin 1790: 4).

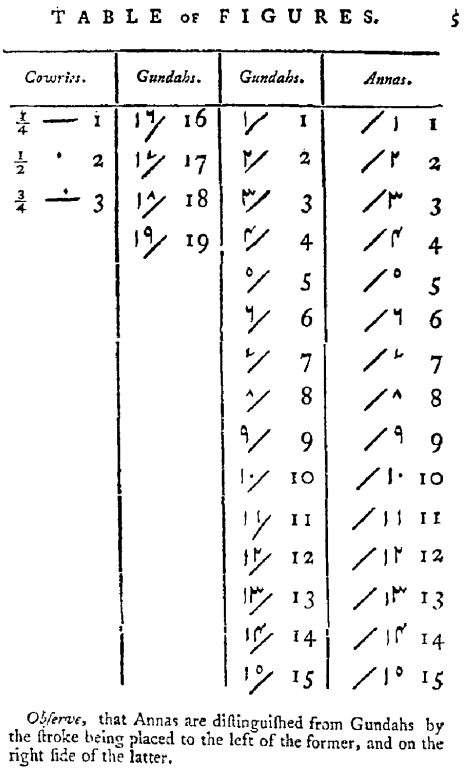


TABLE of FIGURES. 5

Cowries.	Gundahs.	Gundahs.	Annas.
¼ — 1	17/ 16	1/ 1	/١ 1
½ • 2	18/ 17	2/ 2	/٢ 2
¾ — 3	19/ 18	3/ 3	/٣ 3
		4/ 4	/٤ 4
		5/ 5	/٥ 5
		6/ 6	/٦ 6
		7/ 7	/٧ 7
		8/ 8	/٨ 8
		9/ 9	/٩ 9
		10/ 10	/١٠ 10
		11/ 11	/١١ 11
		12/ 12	/١٢ 12
		13/ 13	/١٣ 13
		14/ 14	/١٤ 14
		15/ 15	/١٥ 15

Observe, that Annas are diſtinguiſhed from Gundahs by the ſtroke being placed to the left of the former, and on the right ſide of the latter.

Figure 4: Printed forms of Indic Siyaq Numbers (from Gladwin 1790: 5)

The Rekem, or Siyak characters, being only contractions of Arabic words, the following Table may serve to impress them on the memory.

Arabic Words.	*Rekem.*		*Arabic Words.*	*Rekem.*		*Arabic Words.*	*Rekem.* *joined.*	*separate.*	
عشر	ـــه	10	احد عشر	ـــه	11	١٠	ـه	١	1
عشرين	ـــه	20	اثنا عشر	ـــه	12	عدوان	ـ	٢	2
ثلاثين	ـــه	30	ثالثة عشر	ـــه	13	ثالثة	ـــ	٣	3
اربعين	ـــه	40	اربعة عشر	ـــه	14	اربعة	ـــ	٤	4
خمسين	ـــه	50	خمسة عشر	ـــه	15	خمسة	ـــ	٥	5
ستين	ـــه	60	ستة عشر	ـــه	16	ستة	ـــ	٦	6
سبعين	ـــه	70	سبعة عشر	ـــه	17	سبعة	ـــ	٧	7
ثمانين	ـــه	80	ثمانية عشر	ـــه	18	ثمانية	ـــ	٨	8
تسعين	ـــه	90	تسعة عشر	ـــه	19	تسعة	ـــ	٩	9

N O T E.

It is neceſſary to remark regarding the two firſt digits, that when combined with tens, ـه is a contraction of احد, and ـــ of اثنا

Arabic Words.	*Rekem.*		*Arabic Words.*	*Rekem.*	
الف	ـــ/	1000	مايه	ـا	100
الفان	ـــ/	2000	مايتان	ـا	200
ثلاثة آلاف	ـــ/	3000	ثلاثمايه	ـا	300
اربعة آلاف	ـــ/	4000	اربعمايه	ـا	400
خمسة آلاف	ـــ/	5000	خمسمايه	ـا	500
ستة آلاف	ـــ/	6000	ستمايه	ـا	600
سبعة آلاف	ـــ/	7000	سبعمايه	ـا	700
ثمانية آلاف	ـــ/	8000	ثمانمايه	ـا	800
تسعة آلاف	ـــ/	9000	تسعمايه	ـا	900

Figure 5: Table showing the Arabic sources of Siyaq forms (from Gladwin 1790: 6–7).

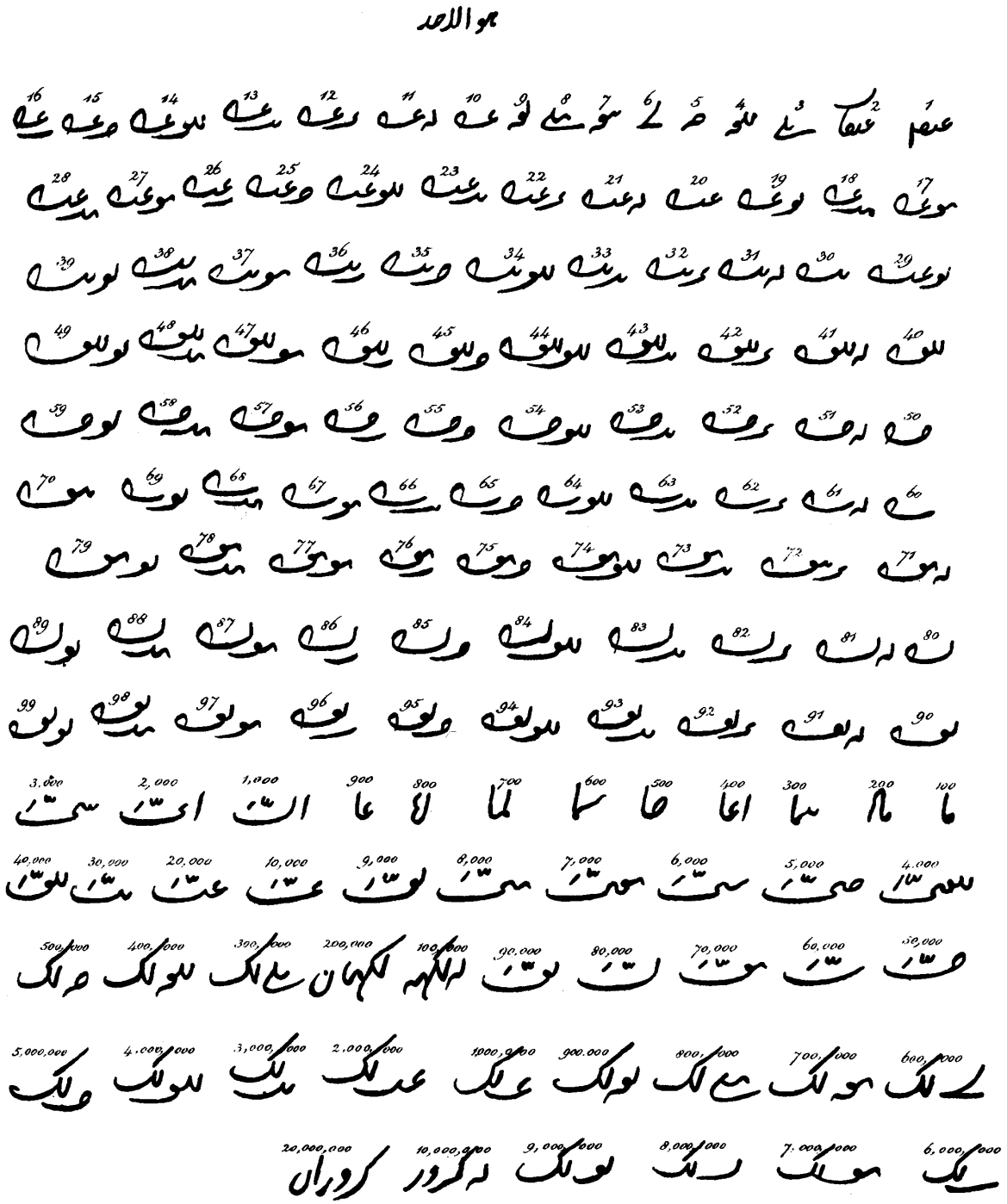


Figure 6: Table showing Siyaq forms as used in South Asia (from Stewart 1825: Plate 7).

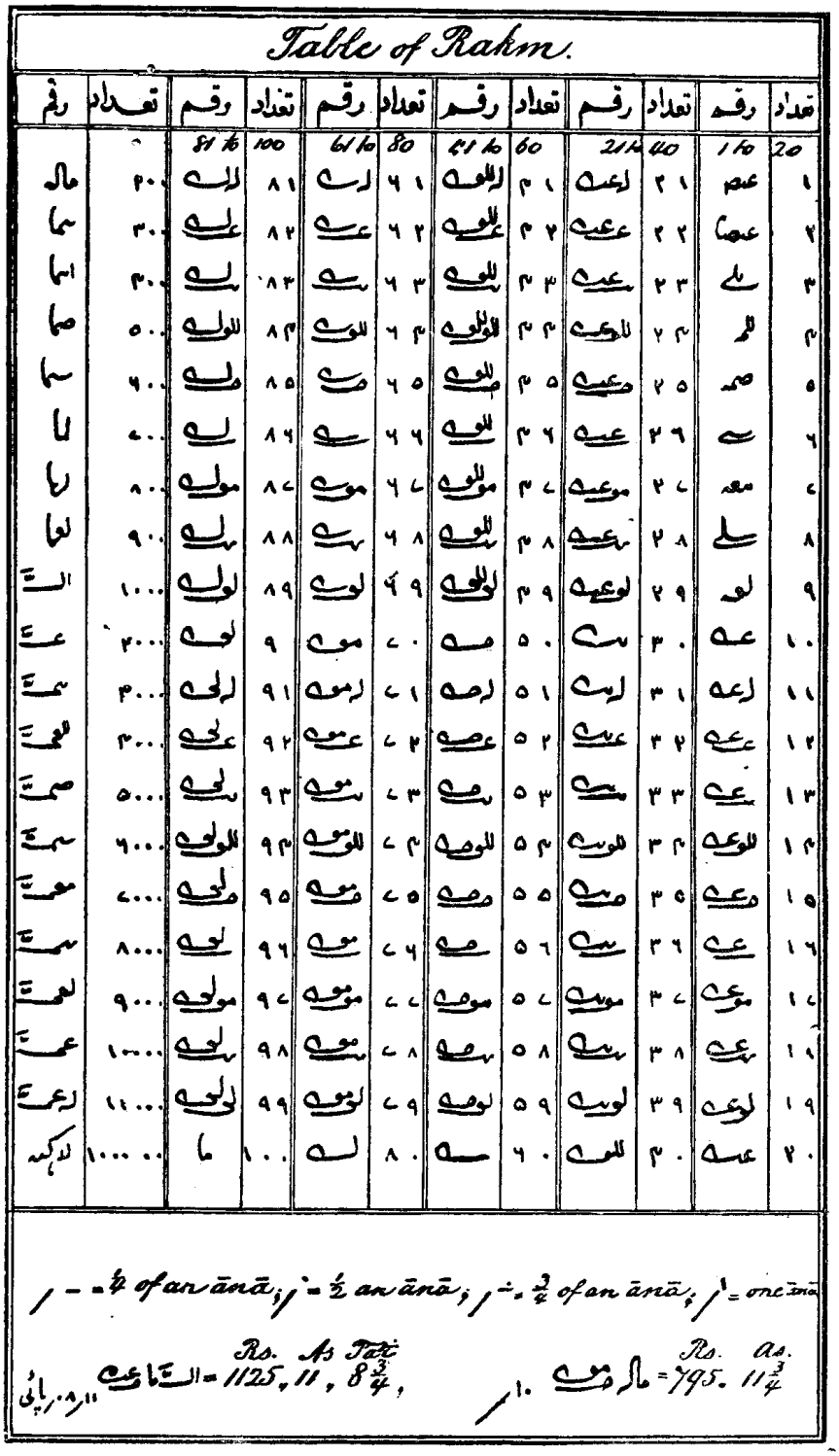
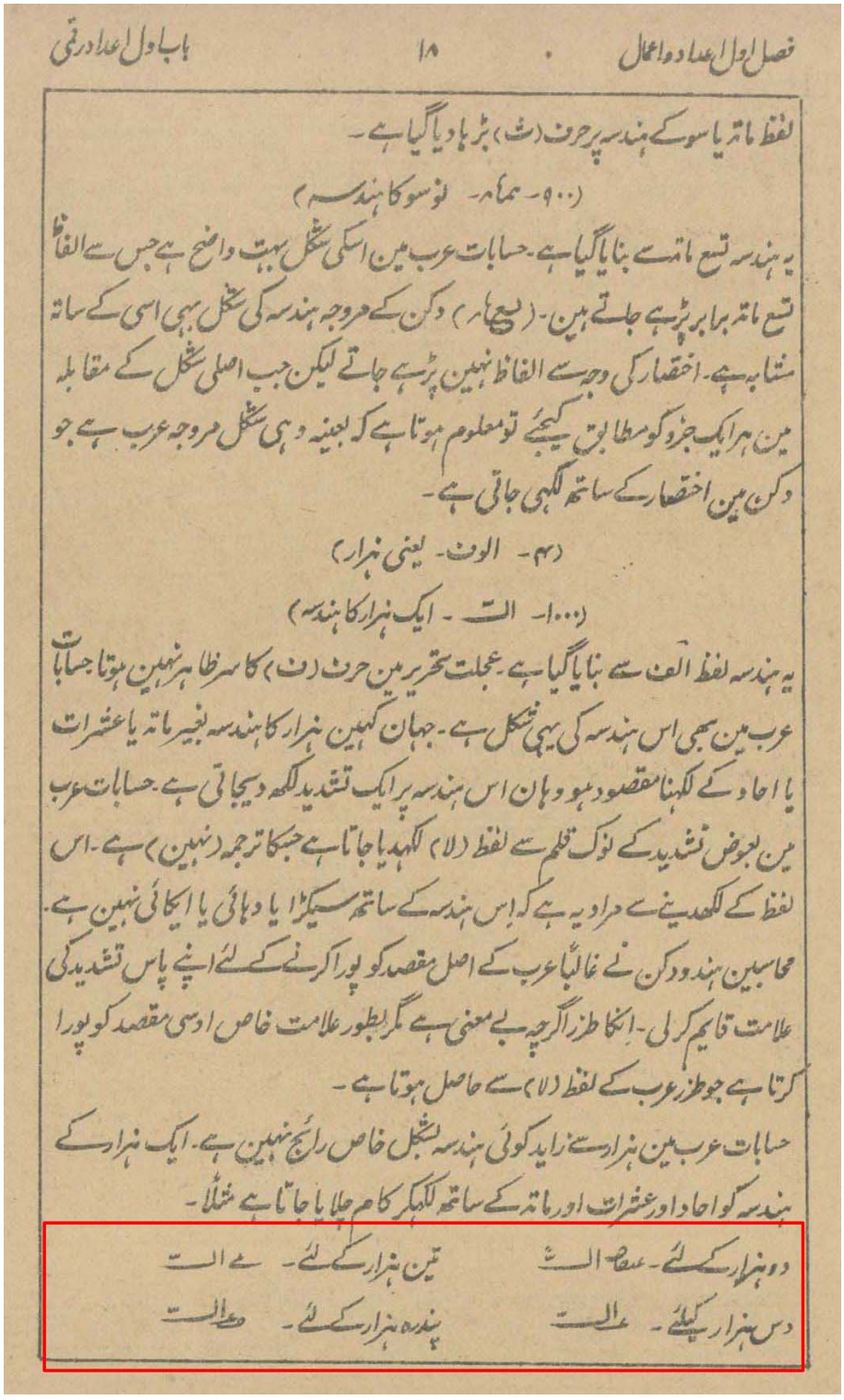


Figure 7: Table showing Indic Siyaq Numbers (from Platts 1909: 60). It should be noted that the values of the examples shown at the bottom of the table may be incorrect. The example to the right, "مالہ ۱۰ر" is given the value "Rs. 795, As. 11¾"; the actual value is "Rs. 297, As. 10". There is a slight error in the example on the left, "الف ماہ ۱۱ر ۰۸ر پائي", which is given the value "Rs. 1125, As. 11, Pai 8¾"; the actual value is "Rs. 1125, As. 11, Pai 8½".



فصل اول اعداد و اعمال ۱۸ باب اول اعداد رقمی

لفظ ماتہ یا سو کے ہندسہ پر حرف (ث) بڑہا دیا گیا ہے۔

(۹۰۰- ثماۃ- نوسو کا ہندسہ)

یہ ہندسہ تسع ماتہ سے بنایا گیا ہے۔ حسابات عرب مین اسکی شکل بہت واضح ہے جس سے الفاظ تسع ماتہ برابر پڑہے جاتے ہین۔ (تسعماۃ) دکن کے مروجہ ہندسہ کی شکل بہی اسی کے ساتہ مشابہ ہے۔ اختصار کی وجہ سے الفاظ نہین پڑہے جاتے لیکن جب اصلی شکل کے مقابلہ مین ہر ایک جزو کو مطابق کیجئے تو معلوم ہوتا ہے کہ بعینہ وہی شکل مروجہ عرب ہے جو دکن مین اختصار کے ساتہ لکہی جاتی ہے۔

(۴- الوف- یعنی ہزار)

(۱۰۰۰- الف - ایک ہزار کا ہندسہ)

یہ ہندسہ لفظ الف سے بنایا گیا ہے۔ عجلت تحریر مین حرف (ف) کا سر ظاہر نہین ہوتا حسابات عرب مین بھی اس ہندسہ کی یہی شکل ہے۔ جہان کہین ہزار کا ہندسہ بغیر ماتہ یا عشرات یا احاد کے لکہنا مقصود ہو وہان اس ہندسہ پر ایک تشدید لکہ دیجاتی ہے۔ حسابات عرب مین بعوض تشدید کے نوک قلم سے لفظ (لا) لکہدیا جاتا ہے جسکا ترجمہ (نہین) ہے۔ اس لفظ کے لکہدینے سے مراد یہ ہے کہ اس ہندسہ کے ساتہ سیکڑا یا دہائی یا ایکائی نہین ہے۔ محاسبین ہندو دکن نے غالبًا عرب کے اصل مقصد کو پورا کرنے کے لئے اپنے پاس تشدید کی علامت قایم کرلی۔ انکا طرز اگرچہ بے معنی ہے مگر بطور علامت خاص اوسی مقصد کو پورا کرتا ہے جو طرز عرب کے لفظ (لا) سے حاصل ہوتا ہے۔

حسابات عرب مین ہزار سے زاید کوئی ہندسہ بشکل خاص رائج نہین ہے۔ ایک ہزار کے ہندسہ کو احاد اور عشرات اور ماتہ کے ساتہ لکہکر کام چلایا جاتا ہے مثلًا۔

دو ہزار کے لئے۔ ٢ الف	تین ہزار کے لئے۔ ٣ الف
دس ہزار کیلئے۔ ١٠ الف	پندرہ ہزار کے لئے۔ ١٥ الف

Figure 8: Deccani style for writing the thousands (from Aziz 1894: 18).

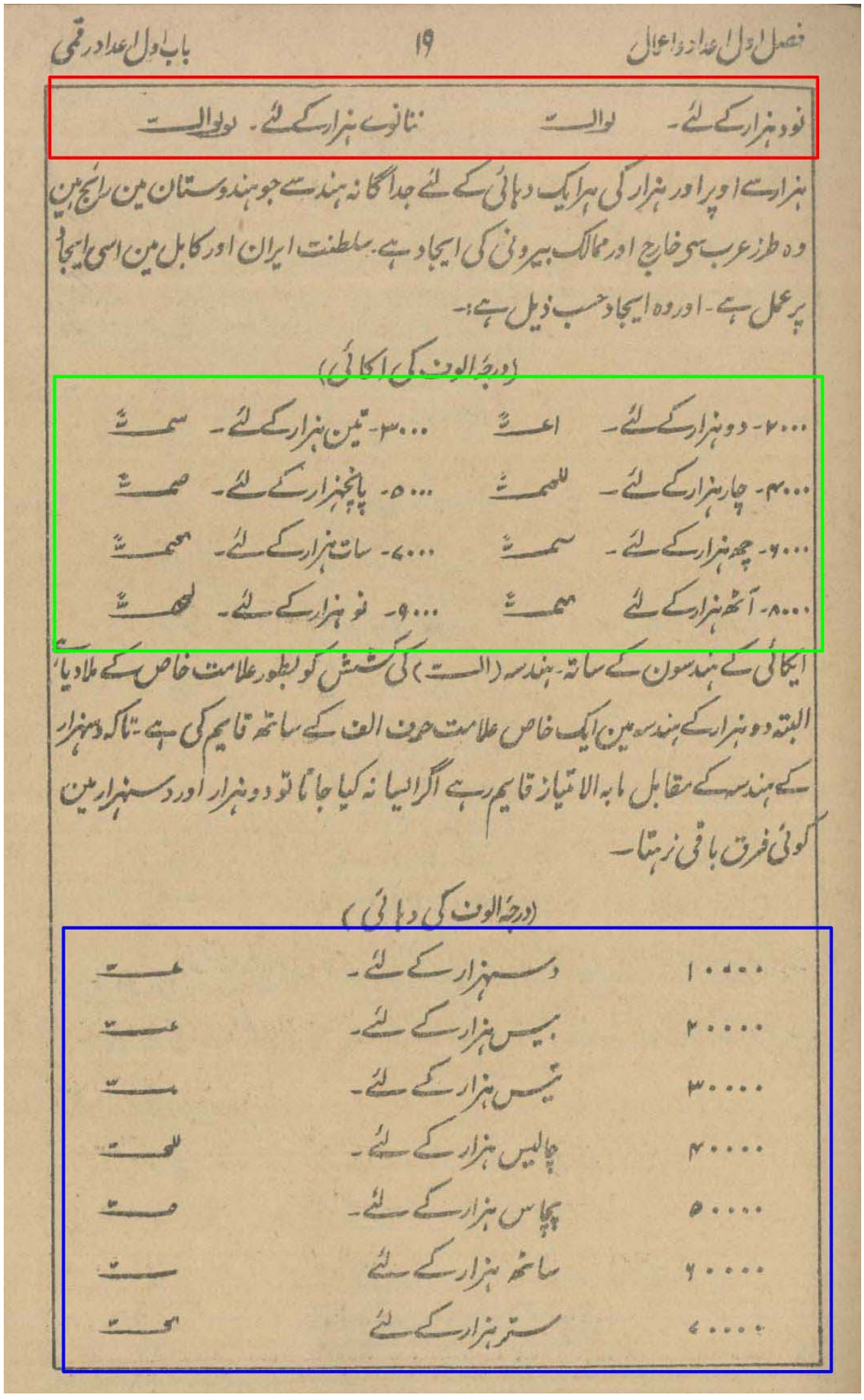


Figure 9: Forms of the thousands (red) in the Deccani style and the regular forms of the thousands (green). The ten thousands is boxed in blue (from Aziz 1894: 19).

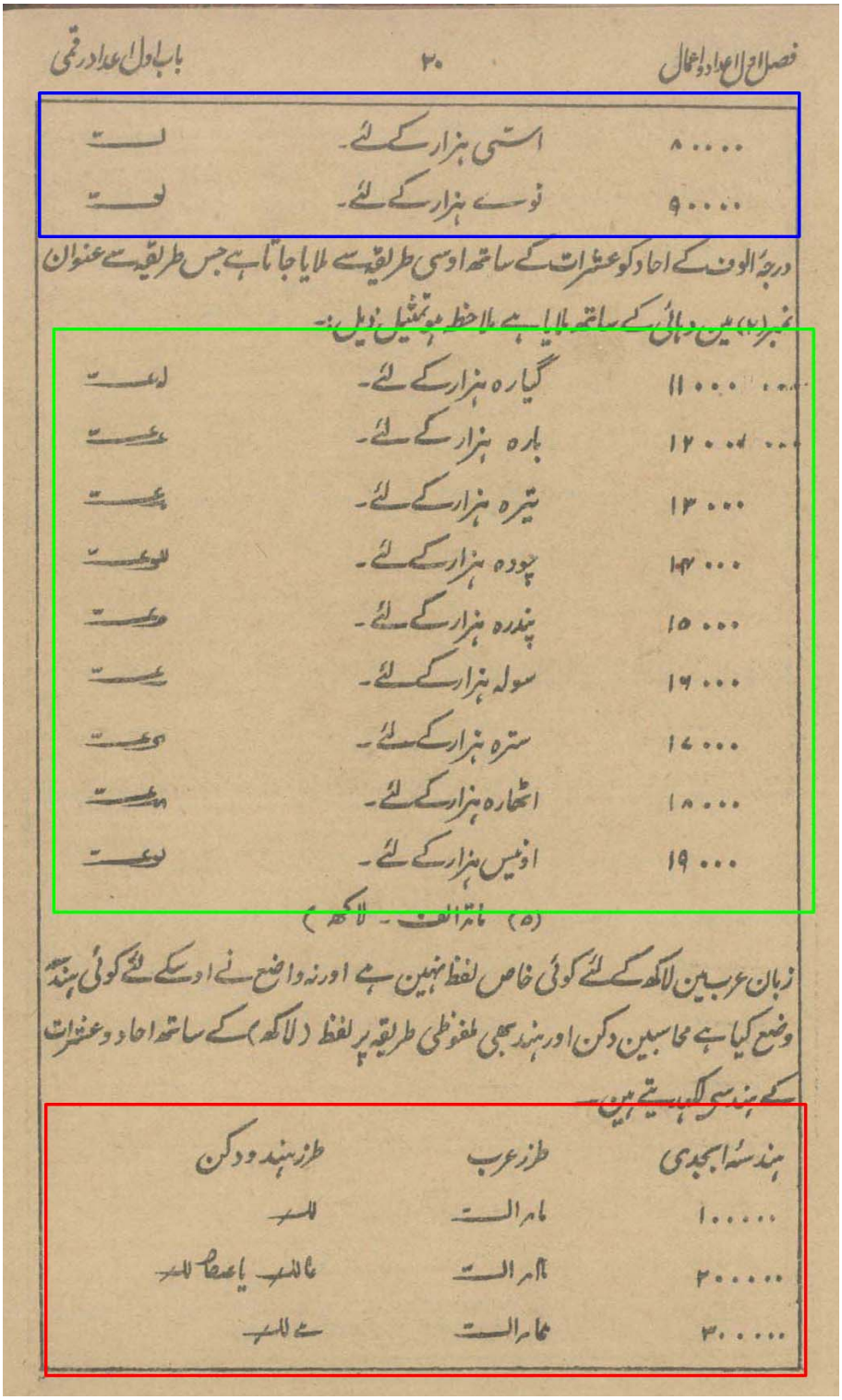


Figure 10: Method of writing the ten thousands (blue; continued from figure 9), the primary multiples of the ten thousands (green) and lakhs (red) in the Deccani style (from Aziz 1894: 20).

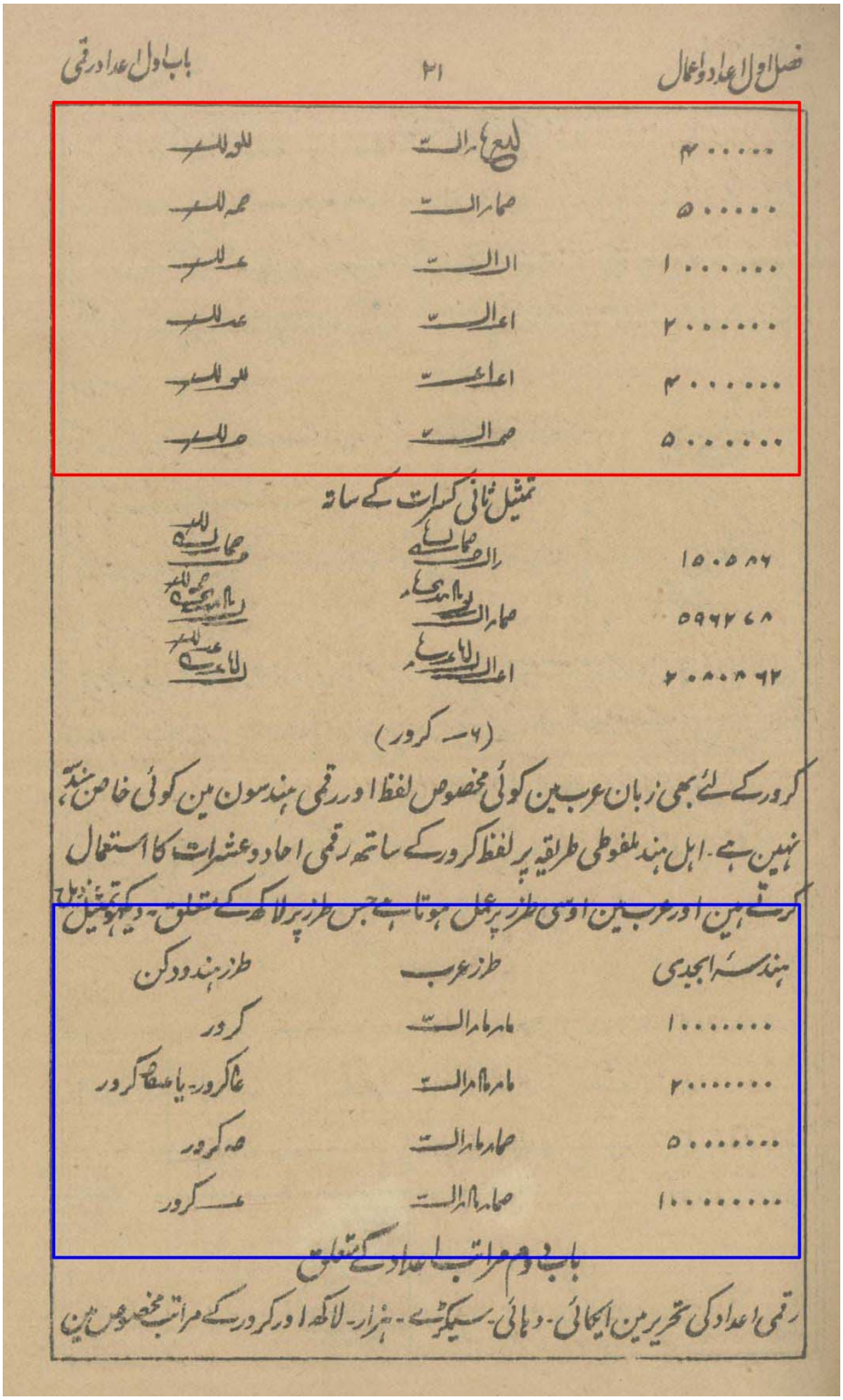
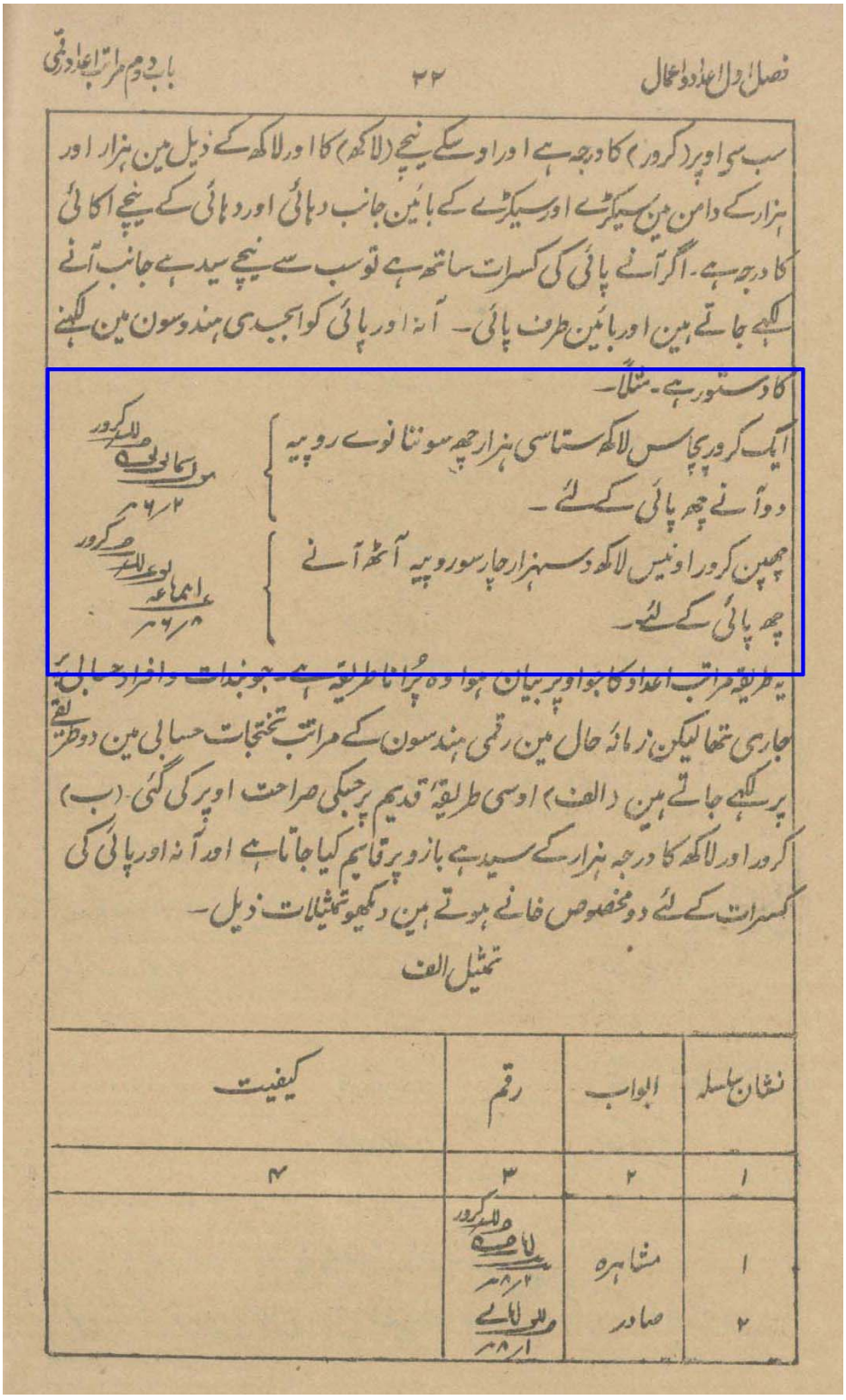


Figure 11: Method of writing lakhs (red; continued from figure 10) in the Deccani style and karors (blue) (from Aziz 1894: 21).



فصل دال اعداد و اعمال ۲۲ باب دوم مراتب اعداد رقمی

سب سے اوپر (کرور) کا درجہ ہے اور اوسکے نیچے (لاکھ) کا اور لاکھ کے ذیل مین ہزار اور ہزار کے دامن مین سیکڑے اور سیکڑے کے بائین جانب دہائی اور دہائی کے نیچے اکائی کا درجہ ہے۔ اگر آنے پائی کی کسرات ساتھ ہے تو سب سے نیچے سیدھے جانب آنے لکھے جاتے ہین اور بائین طرف پائی۔ آنہ اور پائی کو انجدی ہندسون مین لکھنے کا دستور ہے۔ مثلاً۔

ایک کرور پچاس لاکھ ستاسی ہزار چھ سو ننانوے روپیہ دو آنے چھ پائی کے لئے۔

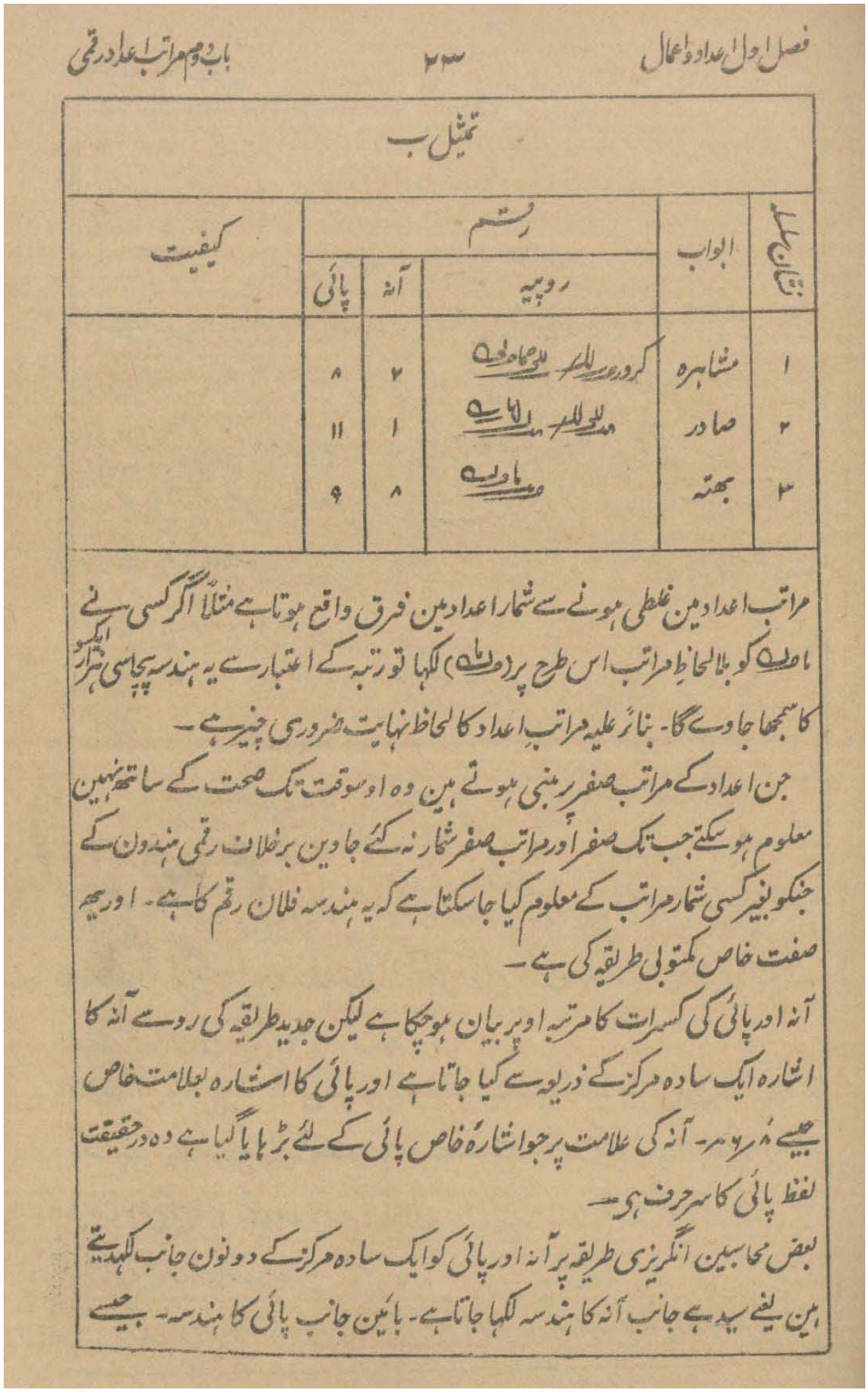
چھپن کرور اونیس لاکھ دس ہزار چار سو روپیہ آٹھ آنے چھ پائی کے لئے۔

یہ طریقہ مراتب اعداد کا جو اوپر بیان ہوا وہ پرانا طریقہ ہے۔ جو بندات و افراد حسابی مین جاری تھا لیکن زمانۂ حال مین رقمی ہندسون کے مراتب تخمجات حسابی مین دو طریقے پر لکھے جاتے ہین (الف) اوسی طریقۂ قدیم پر جسکی صراحت اوپر کی گئی۔ (ب) کرور اور لاکھ کا درجہ ہزار کے سیدھے بازو پر قایم کیا جاتا ہے اور آنہ اور پائی کی کسرات کے لئے دو مخصوص خانے ہوتے ہین دیکھو تمثیلات ذیل۔

تمثیل الف

نشان سلسلہ	ابواب	رقم	کیفیت
۱	۲	۳	۴
۱	مشاہرہ		
۲	صادر		

Figure 12: Examples of lakhs and crores written vertically in inverse order (from Aziz 1894: 22).



فصل اول اعداد و اعمال ۲۳ باب دوم مراتب اعداد رقمی

تمثیل ب

نشان سلسلہ	ابواب	رقم روپیہ	رقم آنہ	رقم پائی	کیفیت
۱	مشاہرہ	کروڑ لاکھ ۵	۲	۸	
۲	صادر	۵ لاکھ ۵	۱	۱۱	
۳	بھتہ	۵	۸	۹	

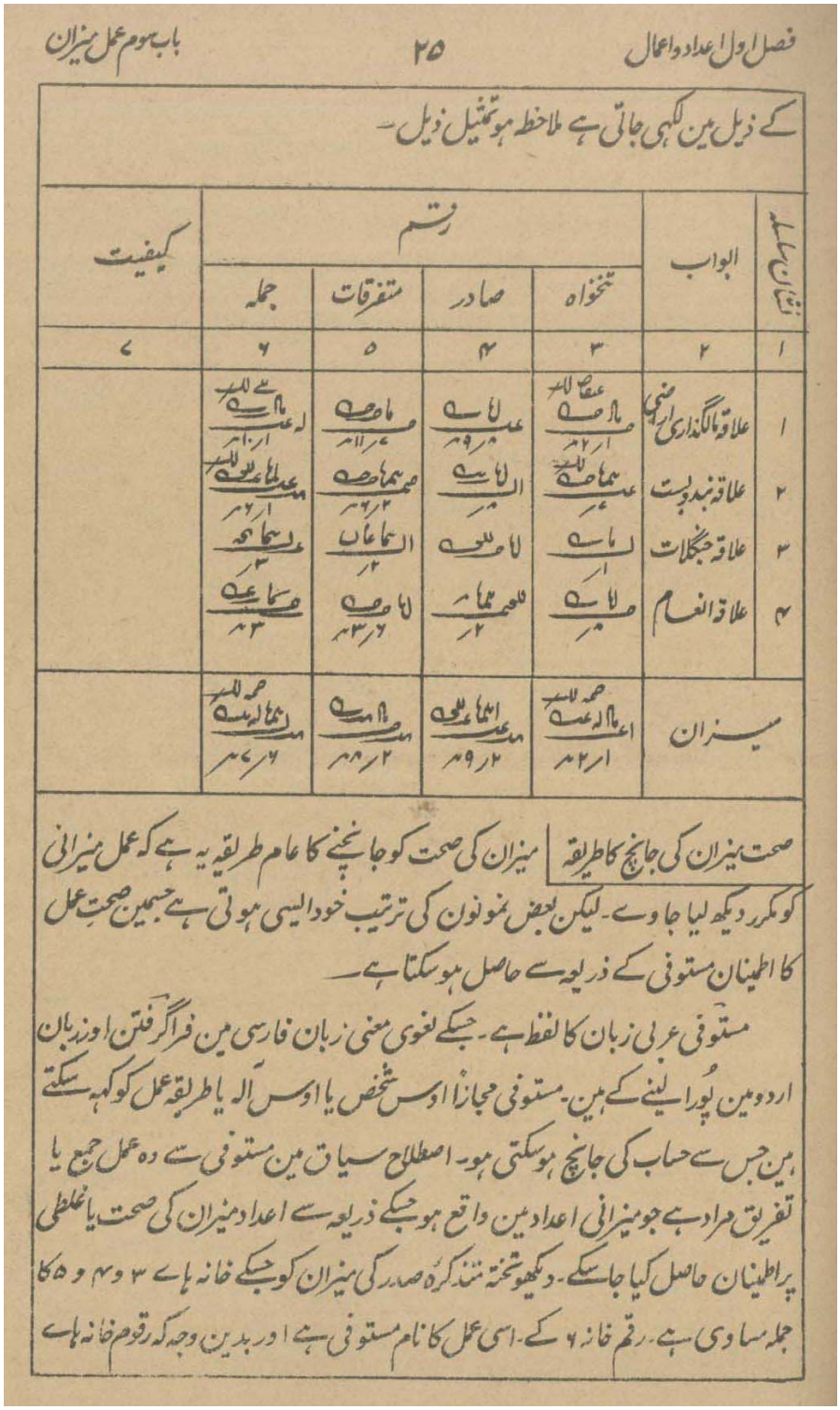
مراتب اعداد مین غلطی ہونے سے شمار اعداد مین فرق واقع ہوتا ہے مثلاً اگر کسی نے ۵ کو بالحاظ مراتب اس طرح پر (۵ لاکھ) لکھا تو رتبہ کے اعتبار سے یہ ہندسہ پچاس ہزار کا سمجھا جاوے گا۔ بنائر علیہ مراتب اعداد کا لحاظ نہایت ضروری چیز ہے۔

جن اعداد کے مراتب صفر پر مبنی ہوتے ہین وہ اوسوقت تک صحت کے ساتھ نہین معلوم ہو سکتے جب تک صفر اور مراتب صفر شمار نہ کئے جاوین برخلاف رقمی ہندون کے جنکو بغیر کسی شمار مراتب کے معلوم کیا جاسکتا ہے کہ یہ ہندسہ فلان رقم کا ہے۔ اور یہہ صفت خاص کمتوبی طریقہ کی ہے۔

آنہ اور پائی کی کسرات کا مرتبہ اوپر بیان ہوچکا ہے لیکن جدید طریقہ کی رو سے آنہ کا اشارہ ایک سادہ مرکز کے ذریعہ سے کیا جاتا ہے اور پائی کا اشارہ بعلامت خاص جیسے ۱ر ۲ر۔ آنہ کی علامت پر جو اشارۂ خاص پائی کے لئے بڑہایا گیا ہے وہ درحقیقت لفظ پائی کا سرحرف ہے۔

بعض محاسبین انگریزی طریقہ پر آنہ اور پائی کو ایک سادہ مرکز کے دونون جانب لکھدیتے ہین یعنے سیدہے جانب آنہ کا ہندسہ لکھا جاتا ہے۔ بائین جانب پائی کا ہندسہ۔ جیسے

Figure 13: More examples of complex numbers (from Aziz 1894: 23).



فصل اول اعداد و اعمال ۲۵ باب سوم عمل میزان

کے ذیل مین لکھی جاتی ہے ملاحظہ ہو تمثیل ذیل۔

نشان سلسلہ	ابواب	رقم				کیفیت
		تنخواہ	صادر	متفرقات	جملہ	
۱	۲	۳	۴	۵	۶	۷
۱	علاقہ مالگذاری اراضی					
۲	علاقہ بندوبست					
۳	علاقہ جنگلات					
۴	علاقہ انعام					
	میزان					

صحت میزان کی جانچ کا طریقہ | میزان کی صحت کو جانچنے کا عام طریقہ یہ ہے کہ عمل میزانی کو مکرر دیکھ لیا جاوے۔ لیکن بعض نمونون کی ترتیب خود ایسی ہوتی ہے جسمین صحت عمل کا اطمینان مستوفی کے ذریعہ سے حاصل ہو سکتا ہے۔

مستوفی عربی زبان کا لفظ ہے۔ جسکے لغوی معنی زبان فارسی مین فراگرفتن اور زبان اردو مین پورا لینے کے ہین۔ مستوفی مجازاً اوس شخص یا اوس آلہ یا طریقہ عمل کو کہہ سکتے ہین جس سے حساب کی جانچ ہو سکتی ہو۔ اصطلاح سیاق مین مستوفی سے وہ عمل جمع یا تفریق مراد ہے جو میزانی اعداد مین واقع ہو جسکے ذریعہ سے اعداد میزان کی صحت یا غلطی پر اطمینان حاصل کیا جا سکے۔ دیکھو تختہ متذکرۂ صدر کی میزان کو جسکے خانہ ہاے ۳ و ۴ و ۵ کا جملہ مساوی ہے۔ رقم خانہ ۶ کے۔ اسی عمل کا نام مستوفی ہے اور بدین وجہ کہ رقوم خانہ ہاے

Figure 14: Examples of complex numbers showing currency notation (from Aziz 1894: 25). Note the positioning of small currency units beneath the sequence of Siyaq numbers.

SYMBOL	VALUE	SYMBOL	VALUE	SYMBOL	VALUE
ـر	-/-/3	شر	-/-/9	١ر	-/1/3
ـ٠ر	-/-/6	ار	-/1/-	١٠ر	-/1/6

SYMBOL	VALUE	SYMBOL	VALUE	SYMBOL	VALUE
١٠ر	-/1/9	عشر	12/-/-	معشر	70/-/-
٢ر	-/2/-	بعشر	13/-/-	لشر	80/-/-
عشر	1/-/-	للعشر	14/-/-	لعشر	90/-/-
غار	2/-/-	مشر	15/-/-	مار	100/-
سے ر	3/-/-	عشر	16/-/-	مار	200/-
للعشر	4/-/-	معشر	17/-/-	سار	300/-
صر	5/-/-	مشر	18/-/-	للعمار	400/-
ے ر	6/-/-	لعشر	19/-/-	صمار	500/-
معشر	7/-/-	عشر	20/-/-	سمار	600/-
سے ر	8/-/-	سشر	30/-/-	معمار	700/-
لعشر	9/-/-	للعشر	40/-/-	لسار	800/-
عشر	10/-/-	صشر	50/-/-	لعمار	900/-
لہ عشر	11/-/-	سشر	60/-/-	الله ر	1,000/-
				لاکھ	lakh/-

Figure 15: Table showing Indic Siyaq forms (from Barker 1967: 356, 357). Note the methods of writing currency and fractions.

8.6. Sums: Both India and Pakistan now have a decimal coinage system, a rupee being divided into one hundred paisas. In Urdu, the decimal point is wirtten as: ٫ .Examples:

١٫٠ = Re. 1.00 ٫٥٠ = 50 p. ٫٠٥ = 5 p. ١٫١٤ = Rs. 1.14

8.7. Before the currency was refomed in the two countries, a rupee was divided into sixteen annas or sixty-four pice (paisa). There was then also a different system, besides the numerals, for writing sums.

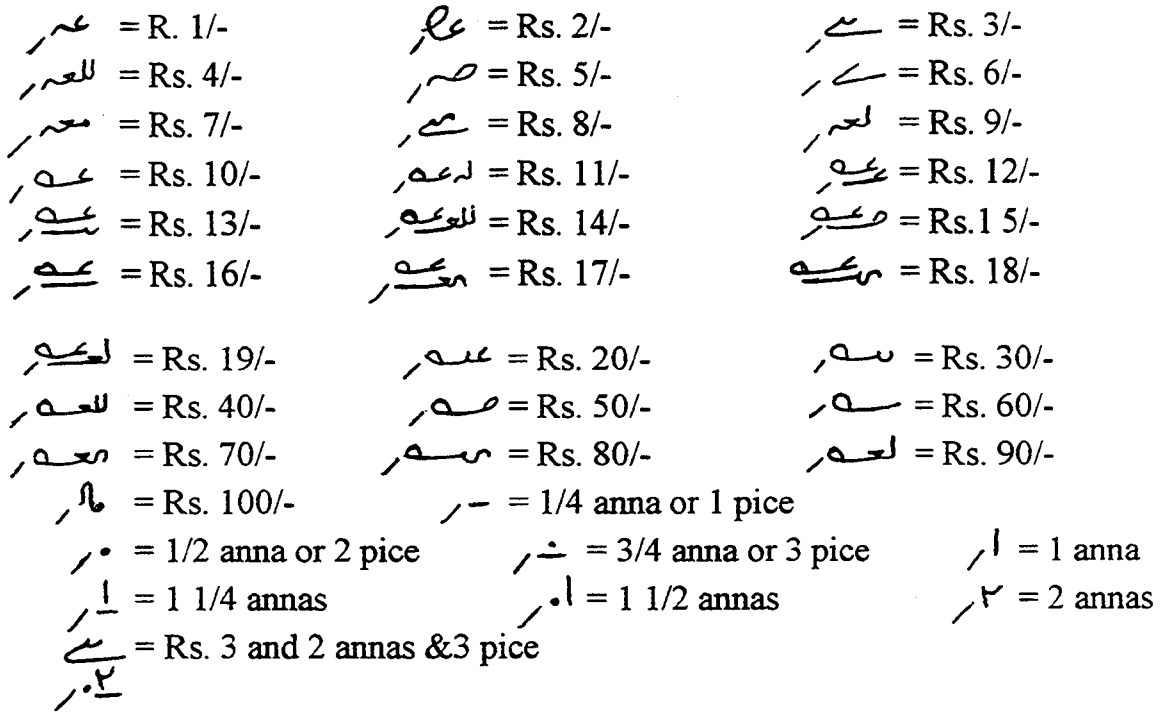


Figure 16: Table showing Indic Siyaq forms (from Naim 1999: 49, 50).

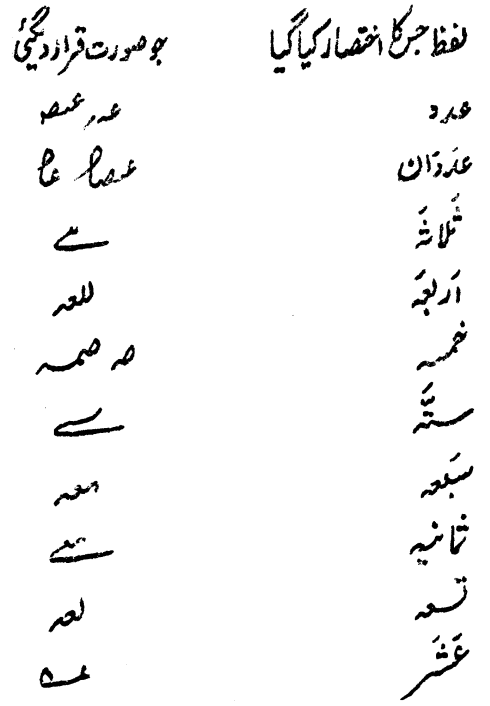


Figure 17: The Arabic sources of the Indic Siyaq numbers (from Muhazzab 195-?: 51).

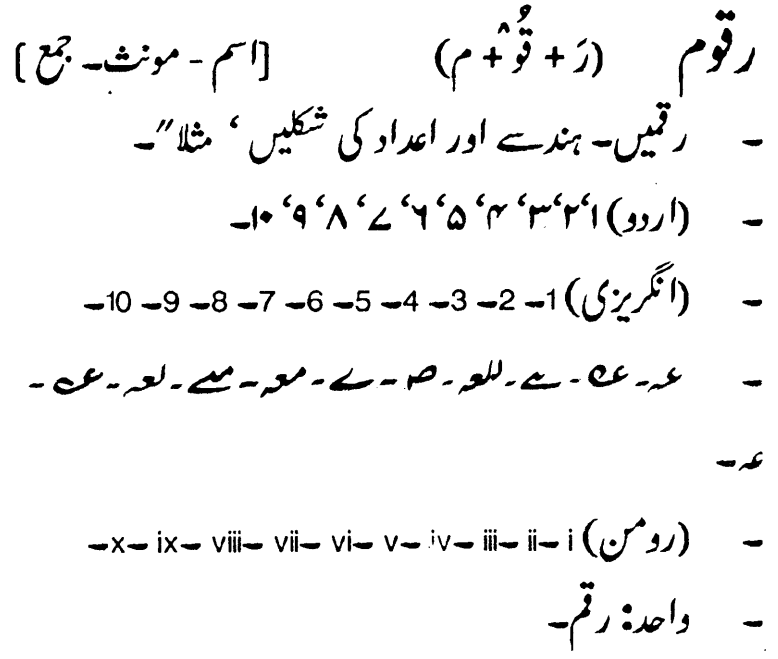


Figure 18: Table showing Indic Siyaq forms (from Muqtadirah Qaumi Zaban 2001: 718).

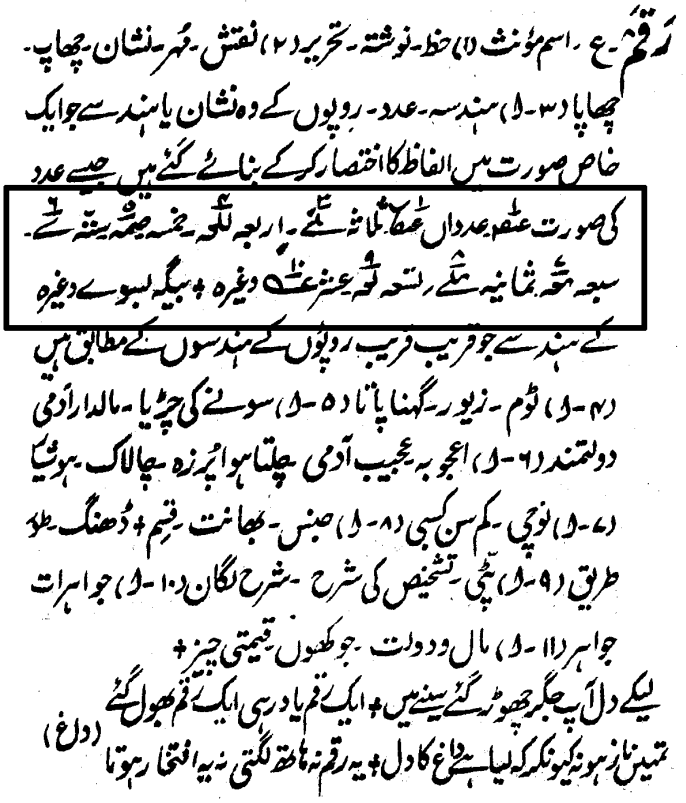

رقم ۔ع ۔اسم مؤنث (۱) خط ۔نوشتہ ۔تحریر (۲) نقش ۔مہر ۔نشان ۔چھاپ ۔
چھاپا (۳ ۔۱) ہندسہ ۔عدد ۔روپوں کے وہ نشان یا ہندسے جو ایک
خاص صورت میں الفاظ کا اختصار کر کے بنائے گئے ہیں جیسے عدد
کی صورت ۸ عدداں ۸ ثمانیہ ۴ اربعہ ۵ خمسہ ۶ ستہ ۷ سبعہ
۸ ثمانیہ ۹ تسعہ ۱۰ عشرہ وغیرہ + بیگہ بسوے وغیرہ
کے ہندسے جو قریب قریب روپوں کے ہندسوں کے مطابق ہیں
(۴ ۔۱) ٹوم ۔زیور ۔گہنا پاتا (۵ ۔۱) سونے کی چڑیا ۔مالدار آدمی
دولتمند (۶ ۔۱) اعجوبہ ۔عجیب آدمی ۔چلتا ہوا پرزہ ۔چالاک ۔ہوشیار
(۷ ۔۱) نوچی ۔کم سن کسبی (۸ ۔۱) جنس ۔بھانت ۔قسم + ڈھنگ ۔طور
طریق (۹ ۔۱) پٹی ۔تشخیص کی شرح ۔شرح لگان (۱۰ ۔۱) جواہرات
جواہر (۱۱ ۔۱) مال و دولت ۔جوکھوں ۔قیمتی چیز +
لیکے دل آپ جگر چھوڑ گئے سینے میں + ایک رقم یاد رہی ایک رقم بھول گئے (داغ)
تمہیں ناز ہو نہ کیونکر کہ لیا ہے داغ کا دل + یہ رقم نہ ہاتھ لگتی نہ یہ افتخار ہوتا

Figure 19: Table showing Siyaq forms as used in South Asia (from Dihlavi 1974: 363).

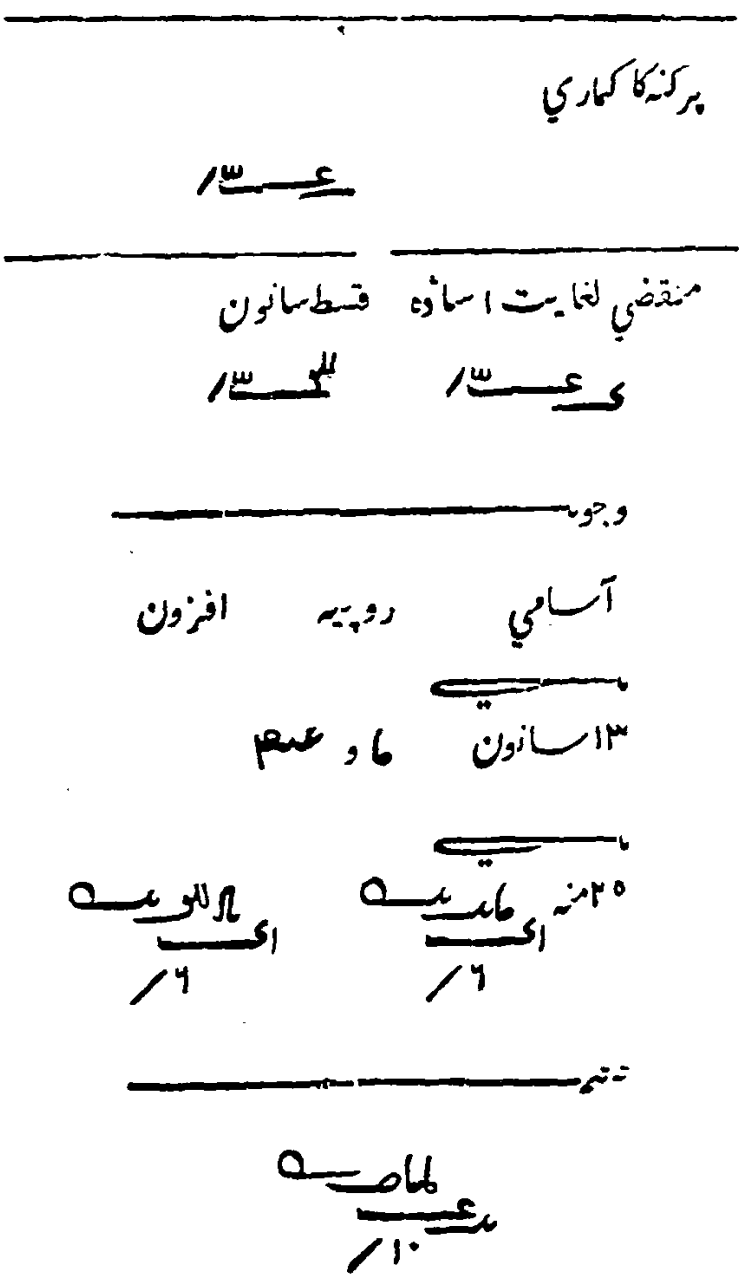


Figure 20: Revenue record from Bengal containing Indic Siyaq Numbers (from Gladwin 1790: 46). Note the ascending vertical manner of writing the Siyaq numbers and the placement of small currency values beneath the numbers.

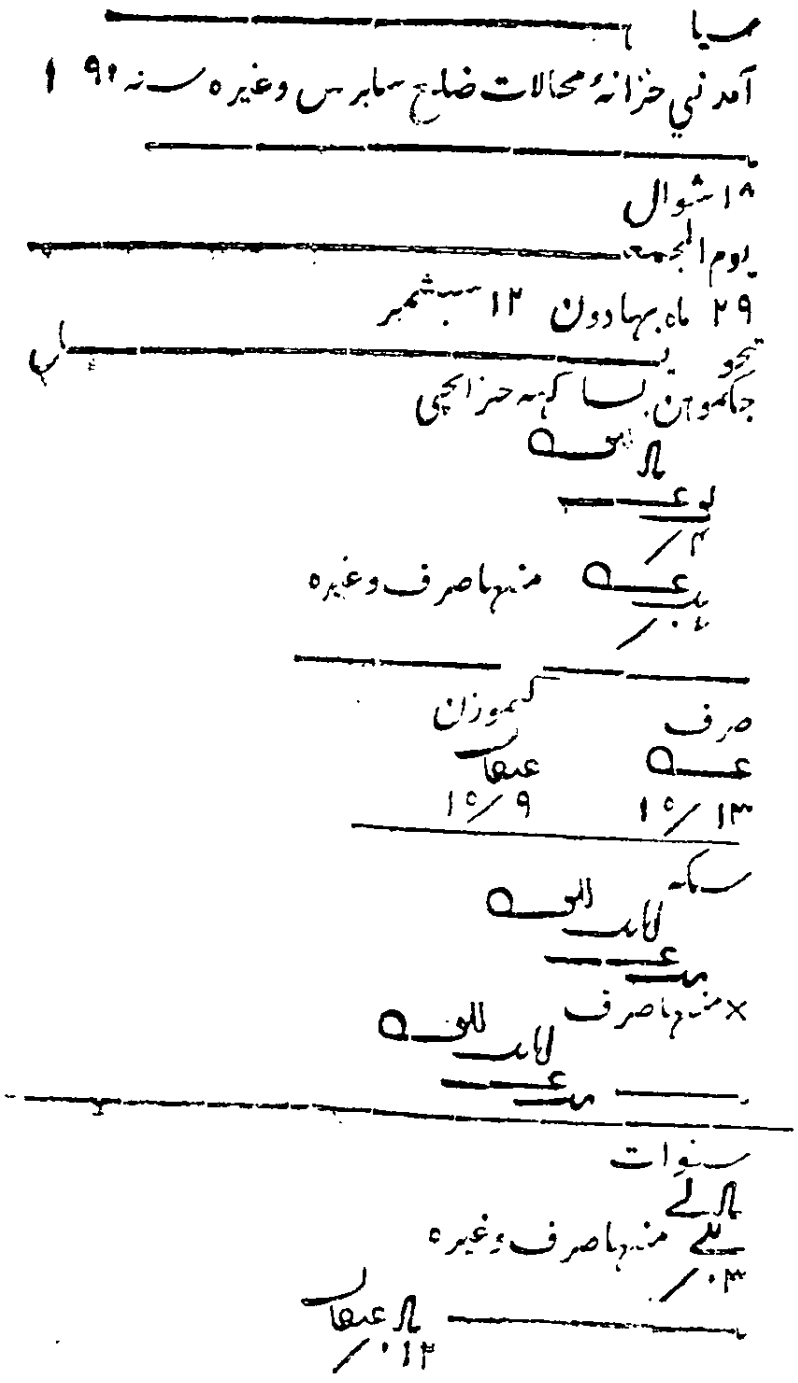


Figure 21: Another revenue record from Bengal containing Indic Siyaq Numbers (from Gladwin 1790: 63). Note the ascending vertical manner of writing the Siyaq numbers and the placement of small currency values beneath the numbers.

Figure 22: A one-rupee note from Hyderabad State from the 1940s showing numbers written in Indic Siyaq, as well as in the Telugu, Kannada, Devanagari, Arabic, and Latin scripts. The 𞺻 INDIC SIYAQ NUMBER ONE is shown in the upper right-hand corner of the reverse. Image courtesy of Rezwan Rezack.

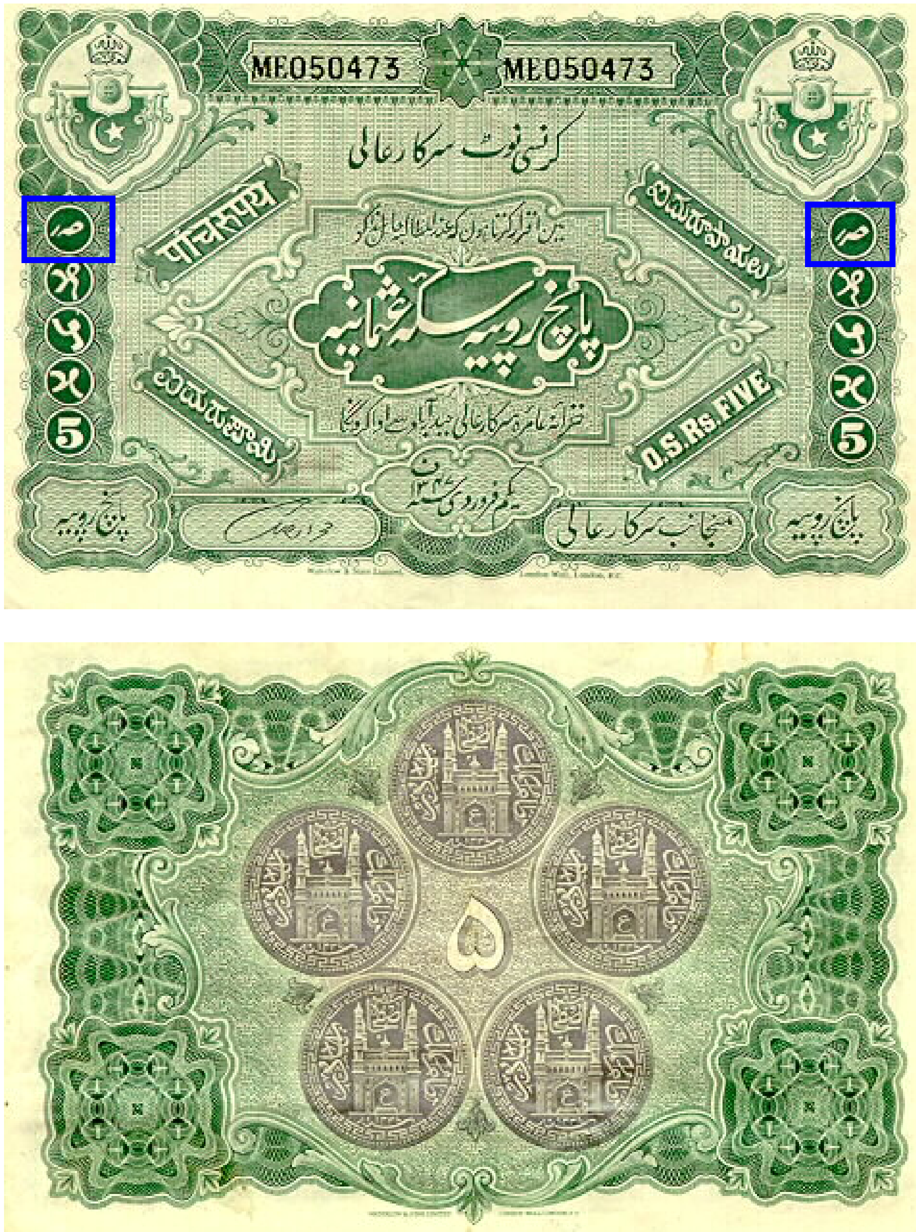


Figure 23: A five-rupee note from Hyderabad State from the 1940s showing numbers written in Indic Siyaq, as well as in the Telugu, Kannada, Devanagari, Arabic, and Latin scripts. The value 𞲅𞲰 <INDIC SIYAQ NUMBER FIVE, INDIC SIYAQ RUPEE MARK> is shown on the obverse.

Figure 24: A ten-rupee note from Hyderabad State from the 1940s showing numbers written in Indic Siyaq, as well as in the Telugu, Kannada, Devanagari, Arabic, and Latin scripts. The 𞺪 INDIC SIYAQ NUMBER TEN is shown in the center of the reverse. Image courtesy of Rezwan Rezack.

Figure 25: A thousand-rupee note from Hyderabad State from the 1940s showing numbers written in Indic Siyaq, as well as in the Telugu, Kannada, Devanagari, Arabic, and Latin scripts. The value 𷼫 INDIC SIYAQ NUMBER ONE THOUSAND followed by the Urdu ہزار (= ہزار) *hazār*, is shown on the front and in the top right corner of the reverse.

Figure 26: A sixty rupee stamp paper from 1807. The value 𐼵 INDIC SIYAQ NUMBER SIXTY is shown in the stamp.

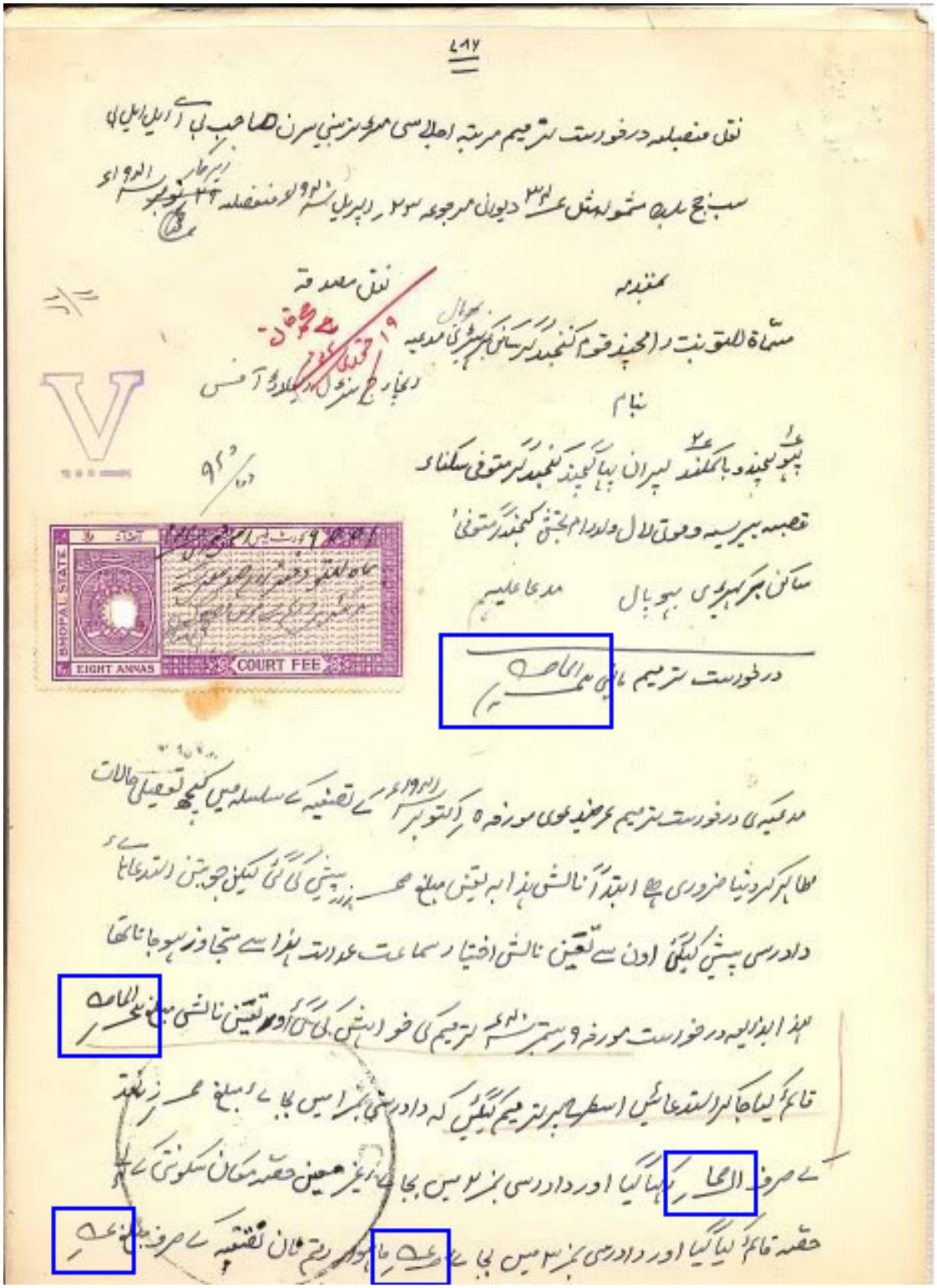


Figure 27: A sixty rupee stamp paper from 1807.

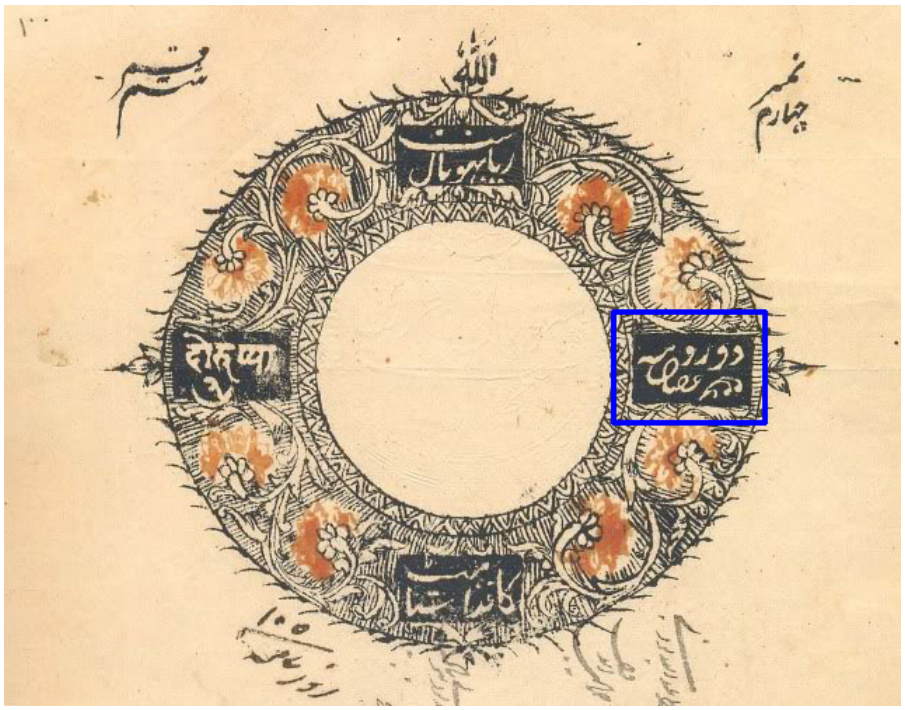


Figure 28: A two anna stamp paper from Bhopal State. The number two is written using the stylistic alternate عصا of عصا INDIC SIYAQ NUMBER TWO is shown in the stamp.

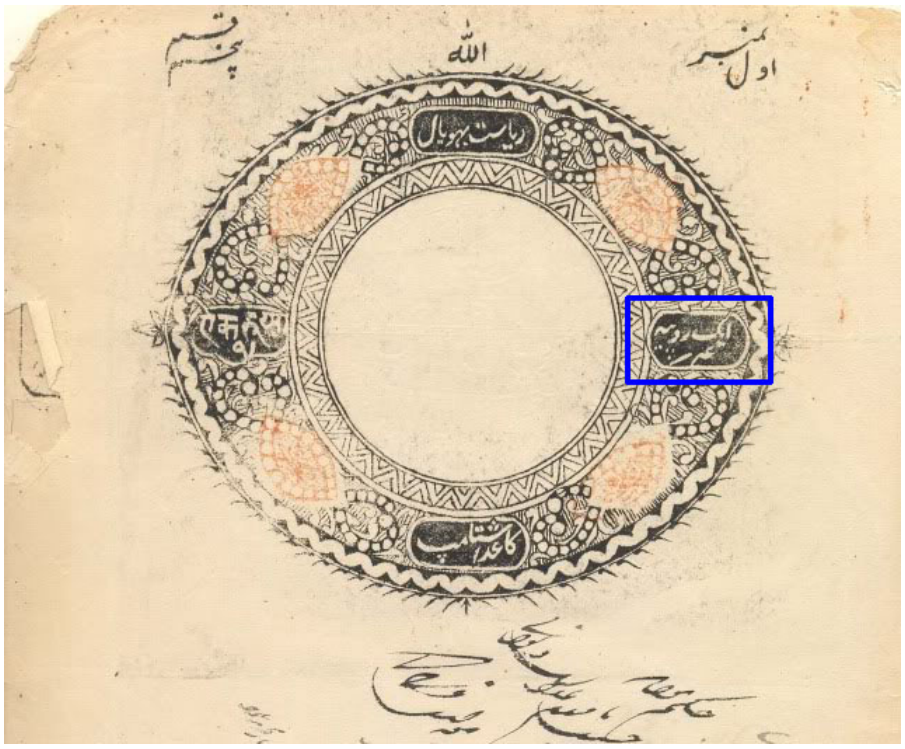


Figure 29: A one rupee stamp paper from Bhopal State. The number one is written using the stylistic alternate عہ of عصم INDIC SIYAQ NUMBER ONE is shown in the stamp.

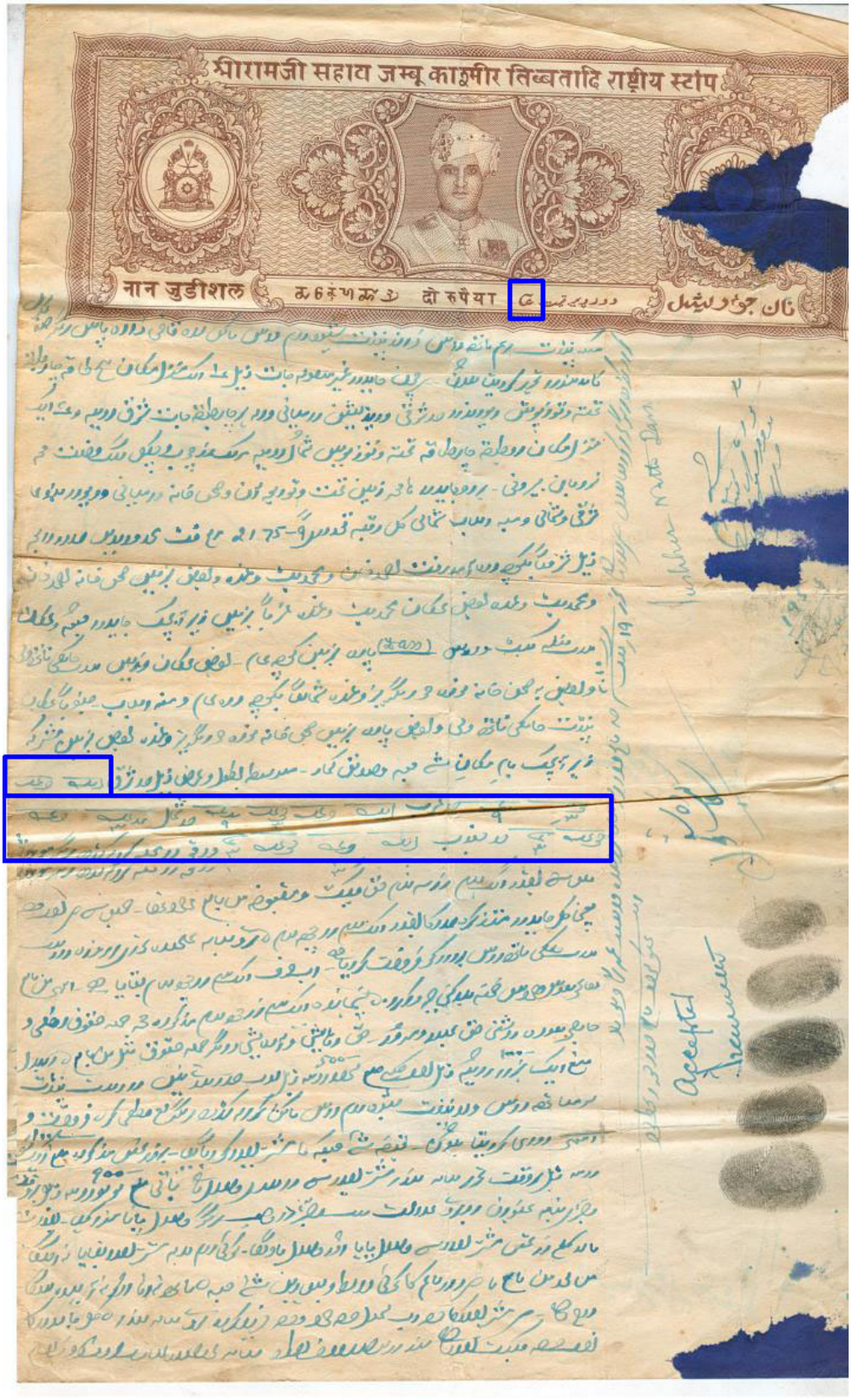


Figure 30: Non-judicial stamp paper from Kashmir State, 1953.

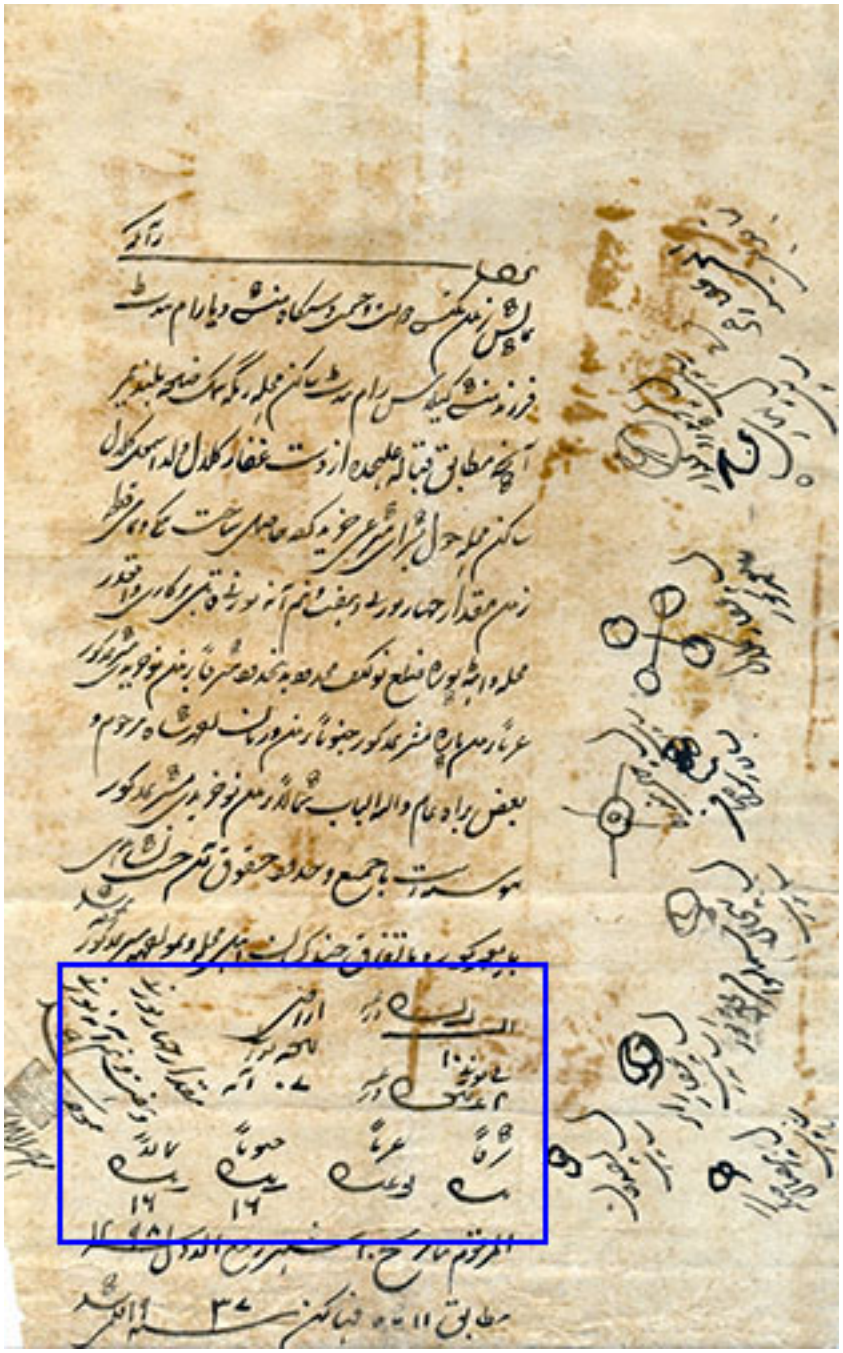


Figure 31: Non-judicial stamp paper from Kashmir State (1880) containing Indic Siyaq numbers.

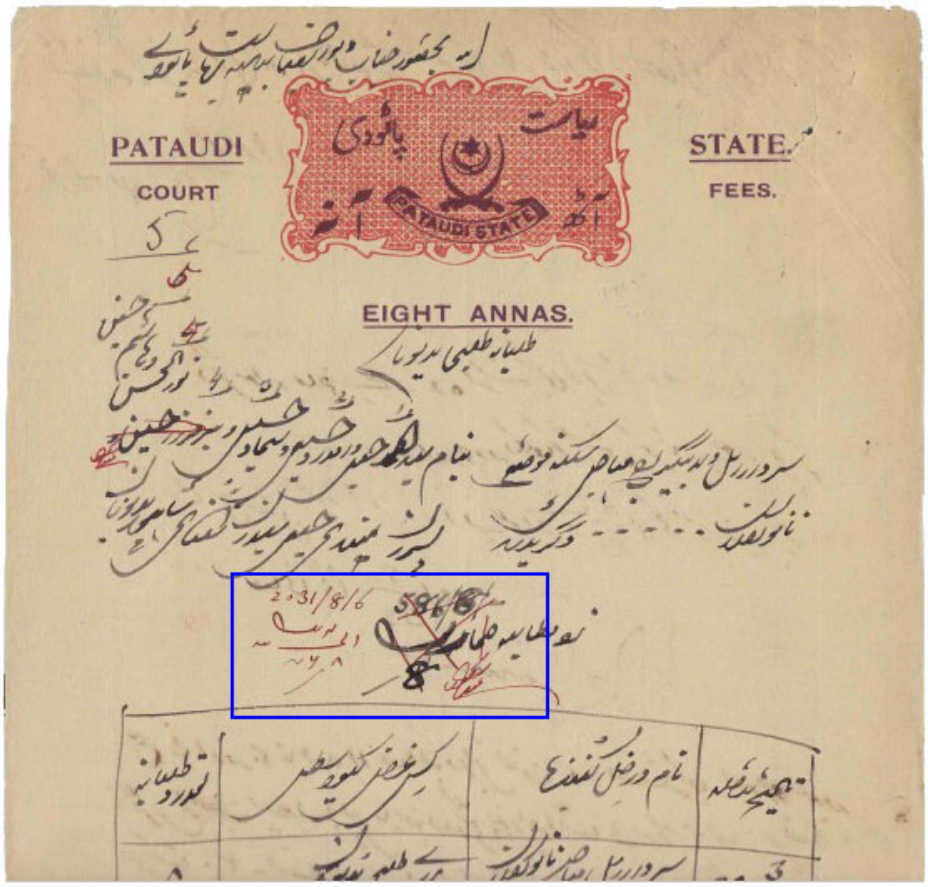


Figure 32: Revenue stamp paper from Pataudi State containing Indic Siyaq numbers.

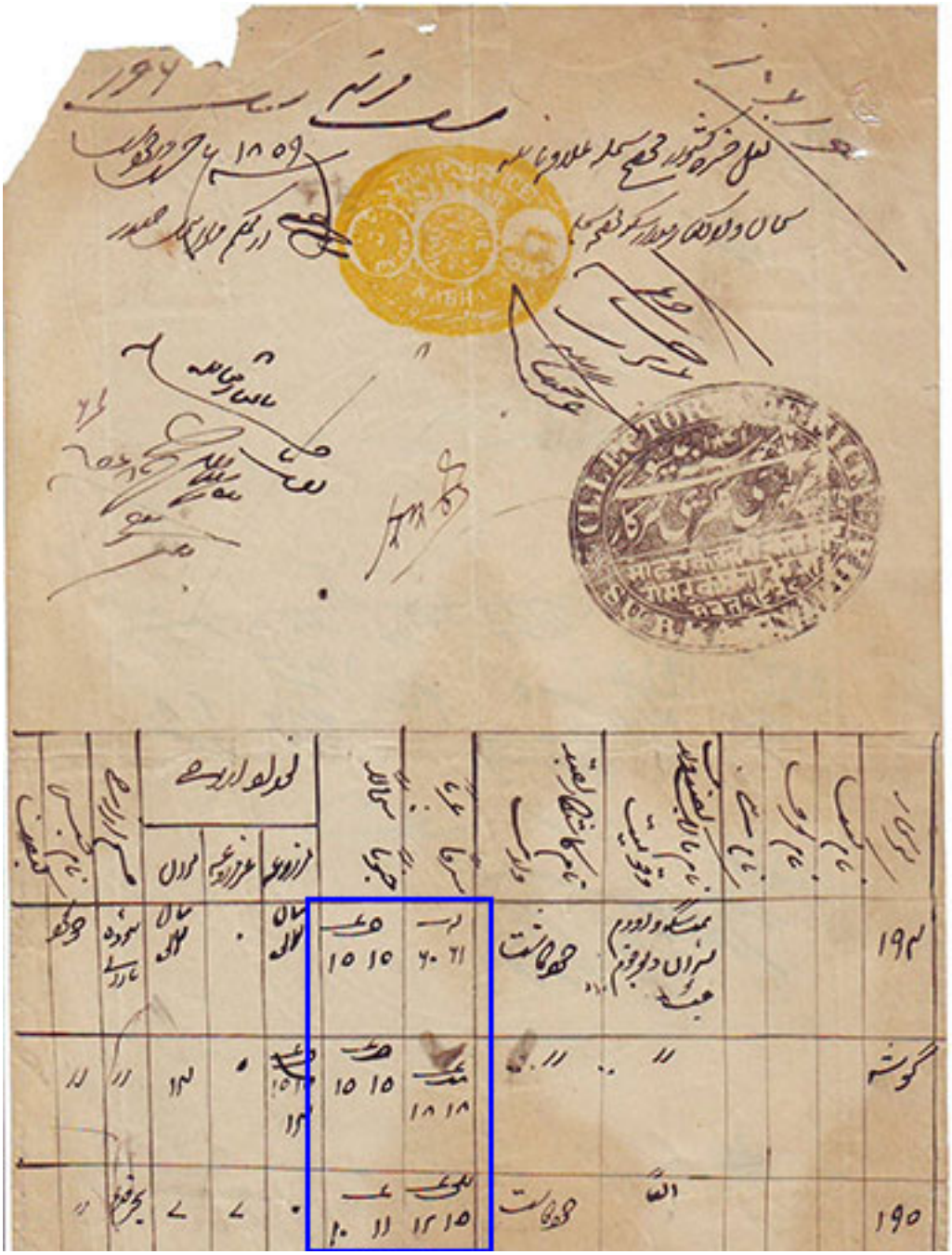


Figure 33: Stamp paper from Nabha State 19th century showing usage of Indic Siyaq.

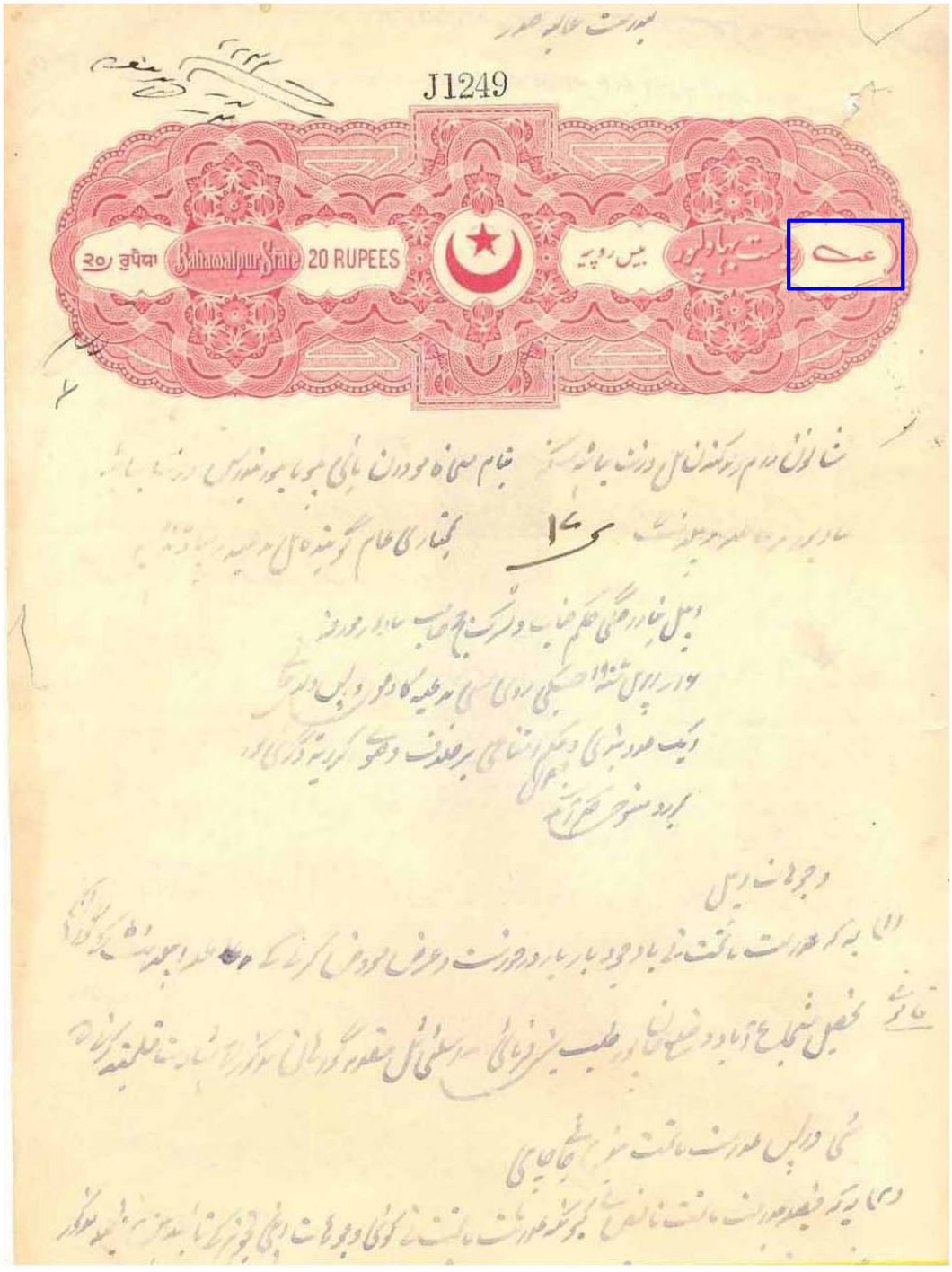


Figure 34: Stamp paper from Bhawalpur State showing usage of Indic Siyaq.

ISO/IEC JTC 1/SC 2/WG 2
PROPOSAL SUMMARY FORM TO ACCOMPANY SUBMISSIONS
FOR ADDITIONS TO THE REPERTOIRE OF ISO/IEC 10646[1]
Please fill all the sections A, B and C below.
Please read Principles and Procedures Document (P & P) from http://std.dkuug.dk/JTC1/SC2/WG2/docs/principles.html **for guidelines and details before filling this form.**
Please ensure you are using the latest Form from http://std.dkuug.dk/JTC1/SC2/WG2/docs/summaryform.html.
See also http://std.dkuug.dk/JTC1/SC2/WG2/docs/roadmaps.html **for latest *Roadmaps*.**

A. Administrative

1. **Title:** *Proposal to encode Indic Siyaq Numbers in Unicode*
2. Requester's name: *Anshuman Pandey / Script Encoding Initiative*
3. Requester type (Member body/Liaison/Individual contribution): *Liaison contribution*
4. Submission date: *5 November 2015*
5. Requester's reference (if applicable):
6. Choose one of the following:
   This is a complete proposal: *Yes*
   (or) More information will be provided later:

B. Technical – General

1. Choose one of the following:
   a. This proposal is for a new script (set of characters): *Yes*
      Proposed name of script: *Indic Siyaq Numbers*
   b. The proposal is for addition of character(s) to an existing block:
      Name of the existing block:
2. Number of characters in proposal: *68*
3. Proposed category (select one from below - see section 2.2 of P&P document):

A-Contemporary		B.1-Specialized (small collection)		B.2-Specialized (large collection)	X
C-Major extinct		D-Attested extinct		E-Minor extinct	
F-Archaic Hieroglyphic or Ideographic				G-Obscure or questionable usage symbols	

4. Is a repertoire including character names provided? *Yes*
   a. If YES, are the names in accordance with the "character naming guidelines" in Annex L of P&P document?
   b. Are the character shapes attached in a legible form suitable for review?
5. Fonts related:
   a. Who will provide the appropriate computerized font to the Project Editor of 10646 for publishing the standard?
      Anshuman Pandey
   b. Identify the party granting a license for use of the font by the editors (include address, e-mail, ftp-site, etc.):
      Anshuman Pandey
6. References:
   a. Are references (to other character sets, dictionaries, descriptive texts etc.) provided? *Yes*
   b. Are published examples of use (such as samples from newspapers, magazines, or other sources) of proposed characters attached? *Yes*
7. Special encoding issues:
   Does the proposal address other aspects of character data processing (if applicable) such as input, presentation, sorting, searching, indexing, transliteration etc. (if yes please enclose information)? *Yes*

8. Additional Information:

Submitters are invited to provide any additional information about Properties of the proposed Character(s) or Script that will assist in correct understanding of and correct linguistic processing of the proposed character(s) or script. Examples of such properties are: Casing information, Numeric information, Currency information, Display behaviour information such as line breaks, widths etc., Combining behaviour, Spacing behaviour, Directional behaviour, Default Collation behaviour, relevance in Mark Up contexts, Compatibility equivalence and other Unicode normalization related information. See the Unicode standard at http://www.unicode.org for such information on other scripts. Also see Unicode Character Database (http://www.unicode.org/reports/tr44/) and associated Unicode Technical Reports for information needed for consideration by the Unicode Technical Committee for inclusion in the Unicode Standard.

[1] Form number: N4502-F (Original 1994-10-14; Revised 1995-01, 1995-04, 1996-04, 1996-08, 1999-03, 2001-05, 2001-09, 2003-11, 2005-01, 2005-09, 2005-10, 2007-03, 2008-05, 2009-11, 2011-03, 2012-01)

C. Technical - Justification

1. Has this proposal for addition of character(s) been submitted before? *No*
   If YES explain
2. Has contact been made to members of the user community (for example: National Body, user groups of the script or characters, other experts, etc.)? *Yes*
   If YES, with whom? *Brian Spooner (University of Pennsylvania), Chander Shekhar (Delhi University)*
   If YES, available relevant documents:
3. Information on the user community for the proposed characters (for example: size, demographics, information technology use, or publishing use) is included? *Yes*
   Reference: *see text of proposal*
4. The context of use for the proposed characters (type of use; common or rare) *Common*
   Reference:
5. Are the proposed characters in current use by the user community? *Yes*
   If YES, where? Reference: *See text of proposal*
6. After giving due considerations to the principles in the P&P document must the proposed characters be entirely in the BMP? *N/A*
   If YES, is a rationale provided?
   If YES, reference:
7. Should the proposed characters be kept together in a contiguous range (rather than being scattered)? *Yes*
8. Can any of the proposed characters be considered a presentation form of an existing character or character sequence? *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
9. Can any of the proposed characters be encoded using a composed character sequence of either existing characters or other proposed characters? *No*
   If YES, is a rationale for its inclusion provided?
   If YES, reference:
10. Can any of the proposed character(s) be considered to be similar (in appearance or function) to, or could be confused with, an existing character? *No*
    If YES, is a rationale for its inclusion provided?
    If YES, reference:
11. Does the proposal include use of combining characters and/or use of composite sequences? *Yes*
    If YES, is a rationale for such use provided? *Yes*
    If YES, reference: *See text of proposal*
    Is a list of composite sequences and their corresponding glyph images (graphic symbols) provided?
    If YES, reference:
12. Does the proposal contain characters with any special properties such as control function or similar semantics? *No*
    If YES, describe in detail (include attachment if necessary)
13. Does the proposal contain any Ideographic compatibility characters? *No*
    If YES, are the equivalent corresponding unified ideographic characters identified?
    If YES, reference: