

Phase 11

Vedic Ganita Sutras & Upsutras

(Sankhya Nishta – Yoga Nishtha – Samya Samuchayya Aadhar Vavastha Ganit)

संख्य निष्ठा योग निष्ठा साम्य समुच्चय आधार व्यवस्था गणित

20 22 12 22 16 23 15 27 18

11.5.8

Ganita Sutras Mathematics
values & Sathapatya format of
Mathematics of Vedic Knowledge Systems

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Phase 11

Vedic Ganita Sutras & Upsutras

(Sankhiya Nishta – Yoga Nishtha – Samya Samuchayya Aadhar Vavastha Ganit)

सौख्य निष्ठा योग निष्ठा साम्य समुच्चय आधार व्यवस्था गणित

20 22 12 22 16 23 15 27 18

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Ganita Sutras Mathematics values & Sathapatya format of Mathematics of Vedic Knowledge Systems

Abstract

Mathematics of Vedic Ganita Sutras and Upsutras. Mathematics is of two phases, firstly uptill 7-space and secondly of 8 onward spaces.

During first phase TCV values are the basis base while during second phase unified TCV is the basis base. First phase is of reach of pole star (7-space) has origin of solar universe (6-space) universe. Second phase, is the unified space, 8-space onwards.

8-space is 8 fold space / of Asht Prakrati, 8 fold nature.

First phase has distinct TCV's of individual vowels and consonants. Second phase is having unified equal TCV (15) for all vowels as well as equal unified TCV (29) for all consonants. However, vowels with yama are of equal unified TCV 27.

Here three operations, addition, multiplication and dimensional synthesis are available.

Dimensional synthesis operation is not being comprehended or applied in non Vedic mathematics. Non vedic mathematics is satisfied with set with two operations. Non vedic mathematics makes sets with one operation as groups and set with two operations as field. Non Vedic mathematics is not unifying values with geometric features. However, vedic mathematics has full unification qua content and its different adaptations at work in existence phenomenon.

Preliminary

Vedas (Samhitas and all Vedic values based scriptures) have reached us in Devnagri alphabet. Ganita Sutras and Upsutras text avails Devnagri alphabet letters carrying their placement values and Sathapatya of Devnagri alphabet. It as such is inherently available here for mathematics of Vedic Ganita Sutras and Upsutras. Further Devnagri alphabet letters have reorganization as akshtas organize reorganization as 14 Maheshwara Sutras. This re-organization, values and format are also inherently available to Ganita Sutras. The basic feature of Ganita Sutras and Upsutras is that they make themselves self referral, by unfolding from within. Illustratively like the feature of text of Ganita Sutra 1 it is in question and answer form. In a way this is inherent organization feature of vedic knowledge system. The question is raised and is also answered as in Ganita Sutra 1, the question (kena) is raised as to (one is more than what) and second word formulation of text of Ganita Sutra 1 answer it as that it is a step ahead of the previous step. Here follows definition of 1. Now only to be taken being '1 as a number and previous it is following' 0 number 'one may be step of any feature and it is to be one step ahead of previous number of steps. Here ten place value system is the start with position. It has 9 numerals parallel with 9 versions of hyper cube 4 while boundary of 5-space is of creative (4-space) 10 components. The further interesting feature is that TCV (Sunyam) = 18 equal to summation value of four folds of hyper cube 5. It really takes us to a system where in the organization '18 is taken as '0', 19 as 1 and 17 as -1 and so on. The Devnagri alphabet and its reorganization as 14 maheshwara sutras is the preliminary knowledge step for Vedic Ganita Sutras mathematics.

PART GANITA SUTRAS

I

Vedic Ganita Sutrani

वैदिक गणित सूत्राणि:

$$\text{TCV (वैदिक / Vedic)} = 25 = h 6 \frac{1}{2}$$

$$\text{TCV (गणित / Ganit)} = 18 = H5$$

TCV (सूत्राणि:/ Sutrani) = 38 = H10
 TCV (वैदिक गणित सूत्राणि: / Vedic Ganita Sutrani)
 = 81 = 3⁴ = h 20 ½

II

Om Tat Sat Iti Nirdesha

ॐ तत सत इति निर्देशः

TCV (ॐ / Om) = 16 = D6
 TCV (तत /Tat) = 9 = h 2 ½
 TCV (सत / Sat) = 8 = D4
 TCV (इति / Iti) = 8 = D4
 TCV (निर्देशः / Nirdesha) = 40 = D12
 TCV (ॐ तत सत इति निर्देशः / Om Tat Sat Iti Nirdesha)
 = 81 = 3⁴ = h 20 ½

III

Devnagri Varanmala

देवनागरी वर्णमाला

Nine vowels अ इ उ ऋ लृ ए ओ ऐ औ 1 2 3 4 5 6 7 8 9	5 x 5 Varga consonants क ख ग घ ङ 1 2 3 4 5 च छ ज झ ञ 2 3 4 5 6 ट ठ ड ढ ण 3 4 5 6 7 त थ द ध न 4 5 6 7 8 प फ ब भ म 5 6 7 8 9
---	--

Anthstha letters: य र ल व 1 3 5 7	Ushmana letters: श स ष ह 2 3 6 9	Yama letters  9 10 11 12 13 14 15 16
--	---	---

TCV (देवनागरी / Devnagri) = 41 = h 10 ½
 TCV (वर्णमाला / Varanmala) = 36 = D11
 TCV (देवनागरी वर्णमाला / Devnagri Varanmala) = 77 =
 77 = 38 + 39 = H10 + h10

IV Maheshwar Chaturdash Sutra

महेश्वर चतुर्दश सूत्र

MAHESHWARA SUTRAS TEXT

- | | | |
|--------------|------------------|-----------------|
| 1. अ इ उ ण् | 6. ल ण् | 11. ख फ छ ठ ध च |
| 2. ऋ लृ क् | 7. ज म ङ ण न म् | ट त व् |
| 3. ए ओ ङ्. | 8. झ भ ज | 12. क प य |
| 4. ऐ औ च् | 9. घ ढ ध ष् | 13. श ष स र |
| 5. ह य व र ट | 10. ज ब ग ड द श् | 14. ह ल् |

TCV (महेश्वर / Maheshwar) = 39 = h 10

TCV (चतुर्दश / Chaturdash) = 24 = D8

TCV (सूत्र / Sutra) = 15 = h4

TCV (महेश्वर चतुर्दश सूत्र / Maheshwar Chaturdash Sutra)

= 78 = H20

78 = 77 + 1

Maheshwar Chaturdash Sutras envelope Devnagri varanmala. Also '78' domain is enveloped within (77) boundary fold.

V Vedic Ganita Sutras Text composition data

Consolidated Table 1

S N	Sutra	Words	Syllables	Letters	TCV
1	एकाधिकेन पूर्वेण ।	2	8	16	68
2	निखिलं नवतश्चरमं दशतः	3	12	28	107
3	ऊर्ध्वतिर्यगभ्याम्	1	5	15	56
4	परावर्त्य योजयेत् ।	2	7	17	52
5	शून्यं साम्यसमुच्चये	2	8	20	71

6	(आनुरूप्ये) शून्यमन्यत् ।	2	8	19	76
7	संकलनव्यवकलनाभ्याम् ।	1	10	24	85
8	पूरणापूरणाभ्याम् ।	1	7	16	68
9	चलनकलनाभ्याम् ।	1	7	16	56
10	यावदूनम् ।	1	4	9	41
11	व्यष्टिसमष्टिः ।	1	5	14	58
12	शेषाण्यङ्केन चरमेण ।	2	8	20	76
13	सोपान्त्यद्वयमन्त्यम् ।	1	7	20	80
14	एकन्यूनेन पूर्वेण ।	2	8	17	81
15	गुणितसमुच्चयः	1	7	16	56
16	गुणकसमुच्चयः ।	1	7	16	52

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Ganita Sutra 1**Table 1****Sutra 1 Text data**

S N	Sutra	Words	Syllables	Letters	TCV
1	एकाधिकेन पूर्वेण ।	2	8	16	68

Table 2

Note :- Syllable with two consonants is shown in blue bracket

Sutra 1 letters (16)					
ए	क्	आ	ध्	इ	क्
ए	न्	अ	प्	ऊ	रुव्
ए	प्	अ			

Distinct vowels are (1) ए sixth vowel, in this text sixth vowel has been availed thrice (2) आ elongated first vowel (अ) (3) अ first vowel, in this text sixth vowel has been availed twice (4) ऊ elongated third vowel (उ)

Distinct consonants are (1) क first varga first consonant, this letter has been availed twice in the text. (2) घृ , fourth consonants of fourth varga row. (3) चृ fifth consonant of fourth consonants of fourth varga row. (4) पृ first consonant of fifth varga consonants row. (5) रृ second Antstha letter here in the text is 'रृ' (6) वृ third Antstha letter (7) णृ fifth letter of third varga row.

C0 = Distinct letters, C1 = Number of distinct letters, C2 = Total distance letters

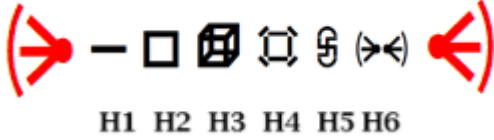
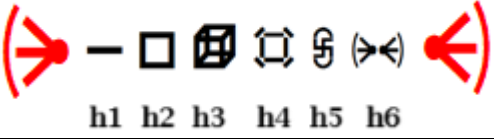
C0	C1	C2
Distinct vowels	4	4
Distinct consonants	7	11

7

Sathapatya of distinct letters of text of Ganita Sutra 1

C0 = Serial number, C1 = Distinct letter, C2 = TCV of the letter, C3 = Sathapatya of letter

C0	C1	C2	C3
1	ए	6	6 space, D6, H6, h6 $D6 = (6, 4, 4, 2) = 16$ $H6 = (4, 5, 6, 7) = 22$ $h6 = (5, 5\frac{1}{2}, 6, 6\frac{1}{2}) = 23$ $(\Rightarrow \Leftarrow) = 6 \text{ space}$ $(\Rightarrow \text{卐} \Leftarrow) = 6 \text{ space dimensional frame}$

			6 space dimensional frame of 6 creative (4-space) dimensions Sathpatya measuring rod  H1 H2 H3 H4 H5 H6 Sathpatya measuring rope  h1 h2 h3 h4 h5 h6
2	आ	2	1 + 1, 2-space H1
3	अ	1	1-space, 1-space dimensional frame of single dimension of negative linear order
4	ऊ	6	3 + 3 = 6, 6-space
5	क्	1	Linear order
6	ध्	7	7-space origin of 6-space
7	न्	8	8-space base fold of H6
8	प्	5	Transcendental 5-space order
9	र्	3	Solid envelope (boundary) of 4-space
10	व्	7	Unity state envelope (boundary) of 6-space
11	प्	7	7-space base fold of H5,

8

Unified State TCV and Sathapatya

Ganita Sutras and Upsutras integrate to unify the mathematical domain in such a way that, the system does not remain porous and becomes of a unified feature of smooth sequential transition, from one phase to other and to integrate entire mathematical domain / basis base mathematics / Vedic mathematics of Vedic knowledge

systems to be parallel with the existence phenomenon in its entirety as well as in its specific expressions.

Ganita Upsutra 4, as it stand in isolation, make specific as that the powers 'are to be only uptill 7 (केवलैः सप्तकमं गुणात्)' from 8th power onwards, the things that unified in such a way that vowels, TCV (स्वर) = 15 becomes the unified TCV of all vowels as 15.

All consonants with TCV (व्यञ्जन) = 29 as unified TCV of all consonants. Pair of consonants become of unified TCV (29, 29) = 31. Three consonants unified TCV (29, 29, 29) = 6.

Unified TCV of vowel with yama is TCV (स्वर, यम) = 15 + 12 = 27 all vowels with yama are of unified TCV value 27.

Here below is the tabulation of above features of unified TCV values.

Table of unified TCV values

Serial number	Letter	Unified TCV
1	स्वर with यम Vowel with Yama	27
2	स्वर Vowel	15
3	एक व्यञ्जन Single consonant	29
4	दो व्यञ्जन Pair of consonants	31
5	तीन व्यञ्जन Triple consonants	6
6	Syllable of one consonant one vowel with yama	29 + 15 + 12 = 56
7	Syllable of two consonant one vowel with yama	31 + 15 + 12 = 58
8	Syllable of three consonants one vowel with yama letters	6 + 15 + 12 = 33

9	Syllable with one consonant and one vowel	$29 + 15 = 44$
10	Syllable with two consonant and one vowel	$15 + 31 = 46$
11	Syllable with three consonant and one vowel	$6 + 15 = 21$
12	न्त्यम् Syllable with four consonants and one vowel	$10 + 15 = 25$

C0 (unified TCV)	C1 (Sathapatya)
6 = (three consonants 29, 29, 29)	H2
10 = (four consonants 29, 29, 29, 29)	H3
15 = (one vowel)	h 4
21 = (one vowel with yama)	h 5 ½
25 = one vowel and four consonants	h 6 ½
27 = one vowel and one consonant	h 7
29 = One consonant	h 7 ½
31 = two consonant (29, 29)	h 8 ½
33 = three consonant (one vowel with yama letter)	h 10 ½
44 = one consonant and one vowel	D13
46 = two consonant and one vowel	H12
56 = one consonant and one vowel with yama letter	D16
58 = two consonant and one vowel with yama letter	H15

9

Table 3

	Sutra 1 syllables (8)'							
	1	2	3	4	5	6	7	8
	ए	का	धि	के	न	पू	वै	ण।
Syllable	6	3	9	7	9	11	15	8
TCV syllable	15	44	44	44	44	44	46	44
UTCv								

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	15	1
2	44	6
3	46	1

Ganita Sutra 2

10

Table 1

Sutra 2 Text data

S N	Sutra	Words	Syllables	Letters	TCV
2	निखिलं नवतश्चरमं दशतः	3	12	28	107

11

Table 2

Note :- Syllable with two consonants is shown in blue bracket

Sutra 2 letters (28)	
न इ ख इ ल अ	न अ व अ त अ
श च अ र् अ म अ	द् अ श् अ त अ :

12

Table 3

	Sutra 2 Syllable (12)		
Syllable	नि ख लं	न व त श्च र मं	द श तः
TCV	10 4 15	9 8 5 5 4 19	7 3 18
UTCV	44 44 56	44 44 44 46 44 56	44 44 56

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	44	9
2	46	1
3	56	3

Ganita Sutra 3

13

Table 1

Sutra 3 Text data

S N	Sutra	Words	Syllables	Letters	TCV
3	ऊर्ध्वतिर्यग्भ्याम्	1	5	15	57

14

Table 2

Note :-

1. Two Syllable with two consonants is shown in blue brackets
2. Two Syllables with three consonants are shown in brown brackets

Sutra 3 letters (15)					
ऊ	ध्	र्	व्	अ	त्
इ	र	य	अ	ग्	भ्
य्	आ	म्			

Table 15

	Sutra 3 syllables (5)				
Syllable	ऊ	ध्व	ति	र्य	ग्भ्याम्
TCV	6	17	6	4	23
UTCV	15	21	44	46	21

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	15	1
2	21	2
3	44	1
4	46	1

Ganita Sutra 4

16

Table 1

Sutra 4 Text data

S N	Sutra	Words	Syllables	Letters	TCV
4	परावर्त्य योजयेत् ।	2	7	17	51

17

Table 2

Note

Syllable with three consonants is shown in **brown** bracket

Sutra 4 letters (17)									
प्	अ	र्	आ	व्	अ	रू	त्	यू	अ
य्	ओ	ज्	अ	य्	ए	त्			

18

Table 3

Sutra 4 syllables (7)						
Syllable TCV	प रा व र्त्य				यो ज येत् ।	
	6	5	8	8	8	5 11
UTCV	44	44	44	21	44	44 46

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	21	1
2	44	5
3	46	1

Ganita Sutra 5

19

Table 1

Sutra 5 Text data

S N	Sutra	Words	Syllables	Letters	TCV
5	शून्यं साम्यसमुच्चये	2	8	20	71

20

Table 2

Note :-

Three Syllables with two consonants are shown in blue brackets

Sutra 5 letters (20)	
शू ऊ न्र्य अ ँ स् आ म्र्य् अ स् अ म्र् उ	
व्र् अ य् ए	

21

Table 3

	Sutra 5 syllables (8)							
Syllable	शू	न्यं	सा	म्य	स	मु	च्च	ये
TCV	8	19	5	11	4	12	5	7
UTCV	44	58	44	46	44	44	46	44

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	44	5
2	46	2
3	58	1

Ganita Sutra 6

22

Table 1

Sutra 6 Text data

S N	Sutra	Words	Syllables	Letters	TCV
6	(आनुरूप्ये) शून्यमन्यत् ।	2	8	19	76

23

Table 2

Note :-

Three Syllables with two consonants are shown in blue brackets

Sutra 6 letters (19)	
आ न् उ र् ऊ	पृ य् ए श् ऊ न्र् अ म् अ
	न्र् अ त् ।

24

Table 3

	Sutra 6 syllables (8)							
Syllable	(आ नु रू प्ये) शू न्य म न्यत् ।							
TCV	2	11	9	12	8	10	10	14
UTCV	15	44	44	46	44	46	44	21

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	15	1
2	21	1
3	44	4
4	46	2

Ganita Sutra 7

25

Table 1

Sutra 7 Text data

S N	Sutra	Words	Syllables	Letters	TCV
7	संकलनव्यवकलनाभ्याम् ।	1	10	24	85

26

Table 2

Note :-

Two Syllables with two consonants are shown in blue brackets

Sutra 7 letters (24)	
स् अं क् अ ल् अ न् अ	व् य् अ व् अ क् अ
ल् अ न् आ	भ् य् आ म् ।

27

Table 3

	Sutra 7 syllables (10)									
Syllable	सं क ल न व्य व क ल ना भ्याम् ।									
TCV	13	2	6	9	9	8	2	6	10	20
UTCV	56	44	44	44	46	44	44	44	44	21

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	21	1
2	44	7
3	46	1
4	56	1

Ganita Sutra 8

28

Table 1

Sutra 8 Text data

S N	Sutra	Words	Syllables	Letters	TCV
8	पूरणापूरणाभ्याम् ।	1	7	16	68

29

Table 2

Note :-

Syllable with two consonants is shown in blue bracket

Sutra 8 letters (16)									
प्	ऊ	र्	अ	ण्	आ	प्	ऊ	र्	अ
ण्	आ	भ्रूय्		आ	म्				

30

Table 3

	Sutra 8 syllables (7)
Syllable	पू र णा पू र णा भ्याम् ।
TCV	11 4 9 11 4 9 20
UTCV	44 44 44 44 44 44 21

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	21	1
2	44	6

Ganita Sutra 9

31

Table 1

Sutra 9 Text data

S N	Sutra	Words	Syllables	Letters	TCV
9	चलनकलनाभ्याम् ।	1	7	16	56

32

Table 2

Note :-

Syllable with two consonants is shown in blue bracket

Sutra 9 letters (16)
च् अ ल् अ न् अ क् अ ल् अ न् आ भ्र् य् आ म् ।

33

Table 3

	Sutra 9 syllables (7)
Syllable	च ल न क ल ना भ्याम् ।
TCV	3 6 9 2 6 10 20
UTCV	44 44 44 44 44 44 21

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	21	1
2	44	6

Ganita Sutra 10

34

Table 1

Sutra 10 Text data

S N	Sutra	Words	Syllables	Letters	TCV
10	यावदूनम् ।	1	4	9	41

35

Table 2

Sutra 10 letters (9)
य् आ व् अ द् ऊ न् अ म् ।

36

Table 3

	Sutra 10 syllables (4)
Syllable	या व दू नम् ।
TCV	3 8 12 18
UTCV	44 44 44 46

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	44	3
2	46	1

Ganita Sutra 11

37

Table 1

Sutra 11 Text data

S N	Sutra	Words	Syllables	Letters	TCV
11	व्यष्टिसमष्टिः ।	1	5	14	58

38

Table 2

Note :-

Three Syllables with two consonants are shown in blue brackets

Sutra 11 letters (14)					
वृ	यू	अ	षट्	इ	स्
अ	म्	अ	षट्	इ	:

39

Table 3

	Sutra 11 syllables (5)
Syllable	व्य ष्टि स म ष्टिः ।
TCV	9 11 4 10 24
UTCV	46 46 44 44 33

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	33	1
2	44	2
3	46	2

Ganita Sutra 12

40

Table 1

Sutra 12 Text data

S N	Sutra	Words	Syllables	Letters	TCV
12	शेषाण्यङ्केन चरमेण ।	2	9	20	76

41

Table 2

Note :-

Two Syllables with two consonants are shown in blue brackets

Sutra 12 letters (20)	
श ए ष् आ	अ ण् य् इ क् ए न् अ च् अ र् अ
म् ए ण् अ	

42

Table 3

	Sutra 12 syllables (9)
Syllable	शे षा ण्य ड्के न च र मे ण ।
TCV	8 8 10 12 9 3 4 7 8
UTCV	44 44 46 46 44 44 44 44 44

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	44	7
2	46	2

Ganita Sutra 13

43

Table 1**Sutra 13 Text data**

S N	Sutra	Words	Syllables	Letters	TCV
13	सोपान्त्यद्वयमन्त्यम् ।	1	7	20	80

44

Table 2

Note :-

1. Two Syllables with three consonants are shown in **brown** brackets
2. One syllable with two consonants is shown in blue bracket.

Sutra 13 letters (20)					
स्	ओ	प्	आ	न् त्र य् अ	द् व् अ य् अ म् अ
				न् त्र य् अ म्	

45

Table 3

	Sutra 13 syllables (7)
Syllable	सो पा न्त्य द्व य म न्त्यम् ।
TCV	10 7 14 14 2 10 23
UTCV	44 44 21 21 44 44 25

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	21	2
2	25	1
3	44	4

Ganita Sutra 14

46

Table 1

Sutra 14 Text data

S N	Sutra	Words	Syllables	Letters	TCV
14	एकन्यूनेन पूर्वेण ।	2	8	17	81

47

Table 2

Note :-

Two Syllables with two consonants are shown in blue brackets

Sutra 14 letters (17)									
ए	क्	अ	न् य्	ऊ	न्	ए	न्	अ	प् ऊ
ए	ण्	अ	।						

48

Table 3

	Sutra 14 syllables (8)
Syllable	ए क न्यू ने न पू र्वे ण
TCV	6 2 15 14 9 11 15 8
UTCV	15 44 46 44 44 44 46 44

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	15	1
2	44	5
3	46	2

Ganita Sutra 15

49

Table 1

Sutra 15 Text data

S N	Sutra	Words	Syllables	Letters	TCV
15	गुणितसमुच्चयः	1	7	16	56

50

Table 2

Note :-

One Syllable with two consonants is shown in blue bracket

Sutra 15 letters (16)						
ग	उ	ण	इ	त्	अ	स् अ म् उ वृ अ य् अ :

51

Table 3

	Sutra 15 syllables (7)
Syllable	गु णि त स मु च्च यः
TCV	6 9 5 4 12 5 15
UTCV	44 44 44 44 44 46 56

Number of Syllables of equal UTV

SN	UTP	Number of syllables
1	44	5
2	46	1
3	56	1

55

Consolidated table of syllables of equal unified TCV

C0 = sutra number, C1 = 15 UTP syllables C2 = 21 UTP C3 = 25 UTP, C4 = 27 UTP, C5 = 33 UTP, C6 = 46 UTP, C7 = 56 UTP, C8 = 58 UTP

C0	C1 15	C2 21	C3 25	C4 33	C5 44	C6 46	C7 56	C8 58
1	1				6	1		
2					9	1	3	
3	1	2			1	1		
4		1			5	1		
5					5	2		1
6	1	1			4	2		
7		1			7	1	1	
8		1			6			
9		1			6			
10					3	1		
11				1	2	2		
12					7	2		
13		1	1		4			
14	1				5	2		
15					5	1	1	
16					5	1	1	
TOTAL 119	4	8	1	1	80	18	6	1
	C1 15	C2 21	C3 25	C4 33	C5 44	C6 46	C7 56	C8 58

Consolidated table of unified TCV values of syllables

Unified TCV values of syllables, increasing order are

1. 6 = (three consonants 29, 29, 29)
2. 10 = (four consonants 29, 29, 29, 29)
3. 15 = (one vowel)
4. 21 = (one vowel with yama)
5. 25 = one vowel and four consonants
6. 27 = one vowel and one consonant

7. 29 = One consonant
8. 31 = two consonant (29, 29)
9. 33 = three consonant (one vowel with yama letter)
10. 44 = one consonant and one vowel
11. 46 = two consonant and one vowel
12. 56 = one consonant and one vowel with yama letter
13. 58 = two consonant and one vowel with yama letter

56

Consolidated Table 2**Frequency of occurrence of distinct letters in the text**

Letter wise occurrence frequency in the text is as under :-

Table of frequency of occurrence of letters in text of Sutras and Upsutras

C0 = serial number, C1= letter, C2= frequency of the letter of Sutras, C3 = frequency of the letter of upsutras, C4 =total frequency of letter of Sutras and Upsutras, C5 = Grand total

C0	C1	C2	
SN	L	FF	
1	अ	67	67
2	आ	15	82
3	इ	7	89
4	उ	6	95
5	ऊ	10	105
6	ए	12	117
7	ओ	2	119
8	क्	8	127
9	ख्	1	128
10	ग्	3	131

11	ङ्	1	132
12	च्	9	141
13	ज्	1	142
14	ट्	2	144
15	प्	8	152
16	त्	9	161
17	ड्	3	164
18	ध्	2	166
19	न्	18	184
20	प्	7	191
21	भ्	4	195
22	म्	15	210
23	य्	24	234

24	र्	11	245
25	ल्	5	250
26	व्	10	260
27	श्	5	265

28	स्	7	272
29	ष्	3	275
30	.	4	
31	:	4	

57

Consolidated Table 3**Consolidated table of syllables with two consonants****C2 = syllables with two consonants****C3 = syllables with three consonants****C4 = syllables with last letter as consonants**

C0	C1	C2	C3	C4
1	एकाधिकेन पूर्वेण ।	1	0	
2	निखिलं नवतश्चरमं दशतः	2	0	
3	ऊर्ध्वतिर्यगभ्याम्	1	2	1
4	परावर्त्य योजयेत् ।	0	1	1
5	शून्यं साम्यसमुच्चये	3	0	
6	(आनुरूप्ये) शून्यमन्यत् ।	3	0	1
7	संकलनव्यवकलनाभ्याम् ।	2	0	1
8	पूरणापूरणाभ्याम् ।	1	0	1
9	चलनकलनाभ्याम् ।	1	0	1
10	यावदूनम् ।	0	0	1
11	व्यष्टिसमष्टिः ।	3	0	
12	शेषाण्यङ्केन चरमेण ।	2	0	

13	सोपान्त्यद्वयमन्त्यम् ।	1	2	1
14	एकन्यूनेन पूर्वेण ।	2	0	
15	गुणितसमुच्चयः	1	0	
16	गुणकसमुच्चयः ।	1	0	
	Total (37)	24	5	8

58

Consolidated Table 4

Note :- **Details of serial numbers 6, 7 and 8 below are tabulated as consolidated table 3**

1. Total letters are 283 and vowels are 119.
2. Consonants and Yama letters are 164.
3. Yama letters are 8.
4. Consonants are 156.
5. **156 = 119 + 37.**
6. Syllables with two consonants are 24.
7. Syllables with three consonants are 5.
8. Syllables with last letter being consonant are 8.

Syllables

C0 = Serial number, C2 = Sutra, C3 = Syllable, C4= Total

C0	C1	C2	C3
1	एकाधिकेन पूर्वेण ।	8	8
2	निखिलं नवतश्चरमं दशतः	12	20
3	ऊर्ध्वतिर्यगभ्याम्	5	25
4	परावर्त्य योजयेत् ।	7	32
5	शून्यं साम्यसमुच्चये	8	40

6	(आनुरूप्ये) शून्यमन्यत् ।	8	48
7	संकलनव्यवकलनाभ्याम् ।	10	58
8	पूरणापूरणाभ्याम् ।	7	65
9	चलनकलनाभ्याम् ।	7	72
10	यावदूनम् ।	4	76

11	व्यष्टिसमष्टिः ।	5	81
12	शेषाण्यङ्केन चरमेण ।	9	90
13	सोपान्त्यद्वयमन्त्यम् ।	7	97

14	एकन्यूनेन पूर्वेण ।	8	105
15	गुणितसमुच्चयः	7	112
16	गुणकसमुच्चयः ।	7	119

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Consolidated Table 5**Consolidated table of distinct syllables****Note :- Total syllables are 119****Distinct syllables are 110.**

C0	C1	C2	C3	
1	एकाधिकेन पूर्वेण ।	8	8	
2	निखिलं नवतश्चरमं दशतः	12	11	1
3	ऊर्ध्वतिर्यग्भ्याम्	5	5	
4	परावर्त्य योजयेत् ।	7	7	
5	शून्यं साम्यसमुच्चये	8	8	
6	(आनुरूप्ये) शून्यमन्यत् ।	8	8	
7	संकलनव्यवकलनाभ्याम् ।	10	8	2
8	पूरणापूरणाभ्याम् ।	7	4	3
9	चलनकलनाभ्याम् ।	7	6	1
10	यावदूनम् ।	4	4	
11	व्यष्टिसमष्टिः ।	5	4	1
12	शेषाण्यङ्केन चरमेण ।	9	9	

13	सोपान्त्यद्वयमन्त्यम् ।	7	6	1
14	एकन्यूनेन पूर्वेण ।	8	8	
15	गुणितसमुच्चयः	7	7	
16	गुणकसमुच्चयः ।	7	7	
		119	110	9

60

Consolidated Table 6**Consolidated table of repeating syllables****C2 = Syllables, C3 = distinct syllables in Sutra****C4 = Repeating syllables / occurrence in previous Sutras**

	C1	C2	C3	C4	
1	एकाधिकेन पूर्वेण ।	8	8	0	
2	निखिलं नवतश्चरमं दशतः	12	11	1	न
3	ऊर्ध्वतिर्यग्भ्याम्	5	5	0	
4	परावर्त्य योजयेत् ।	7	7	1	व
5	शून्यं साम्यसमुच्चये	8	8	1	ये
6	(अनुरुप्ये) शून्यमन्यत् ।	8	8	4	शू न्य म न्य
7	संकलनव्यवकलनाभ्याम् ।	10	8	3	क ल न
8	पूरणापूरणाभ्याम् ।	7	4	1	पू
9	चलनकलनाभ्याम् ।	7	6	4	क ल ना भ्याम् ।
10	यावदूनम् ।	4	4	2	व न
11	व्यष्टिसमष्टिः ।	5	4	2	स म

12	शेषाण्यङ्केन चरमेण ।	9	9	4	न च र ण
13	सोपान्त्यद्वयमन्त्यम् ।	7	6	1	म
14	एकन्यूनेन पूर्वेण ।	8	8	6	ए क न पू र्वे ण
15	गुणितसमुच्चयः	7	7	1	त स मु च्च
16	गुणकसमुच्चयः ।	7	7	0	गु ण क स मु च्च यः ।
		119	110	31	

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Consolidated Table 7

Consolidated table of distinct classes of syllables

Sutras avail only seven vowels

SN	L	FF	
1	अ	67	67
2	आ	15	82
3	इ	7	89

4	उ	6	95
5	ऊ	10	105
6	ए	12	117
7	ओ	2	119

Out of these 7 vowels, 'अ, उ & twice ए', make 4 syllables with no consonants. Last letter as consonants are 8. Such last letters are 'त् & म्'. Distinct syllables are 68 parallel with

TCV (पञ्चमहाभूतः Panchmahabhut)

Distinct single consont syllables are 39, parallel with

TCV (महेश / Mahesh / Lord Shiv)

Total vowels 119, vowels with yama letters 8, syllables with last letter being consonant, repeating syllables 31, total

distinct consonant $119 - 8 - 8 - 31 = 72$, syllables (only vowels and no consonants) 4. Balance distinct syllables $72 - 4 = 68$. Triple consonants syllables 5, double consonants syllable 24 balance single consonants syllables 39

62

Consolidated Table 8

Consolidated table of 39 single consonant syllables

	C1	C2	C3	C4	
1	एकाधिकेन पूर्वेण ।	8	8	0	
	ए का धि के न पू ण ।				
2	निखिलं नवतश्चरमं दशतः	12	11	1	
	नि खि व त द श				
3	ऊर्ध्वतिर्यग्भ्याम्	5	5	0	
	ऊ ति				
4	परावर्त्य योजयेत् ।	7	7	1	
	प यो ज ये				
5	शून्यं साम्यसमुच्चये	8	8	1	
	शू सा स मु				
6	(अनुरूप्ये) शून्यमन्यत् ।	8	8	4	
	अ नु रू				
7	संकलनव्यवकलनाभ्याम् ।	10	8	3	
	ल ना				
8	पूरणापूरणाभ्याम् ।	7	4	1	

	X x x				
9	चलनकलनाभ्याम् ।	7	6	4	
	च				
10	यावदूनम् ।	4	4	2	
	या दू				
11	व्यष्टिसमष्टिः ।	5	4	2	
12	शेषाण्यङ्केन चरमेण ।	9	9	4	
	शे षा मे				
13	सोपान्त्यद्वयमन्त्यम् ।	7	6	1	
	सो पा य				
14	एकन्यूनेन पूर्वेण ।	8	8	6	
	ने				
15	गुणितसमुच्चयः	7	7	1	
	गु णि				
16	गुणकसमुच्चयः ।	7	7	0	
	X x x				

C0	C1			
1	एकाधिकेन पूर्वेण ।	र्वे		
2	निखिलं नवतश्चरमं दशतः	श्च मं		लं मं तः

3	ऊर्ध्वतिर्यगभ्याम्	र्य	र्ध्व	भ्याम्
4	परावर्त्य योजयेत् ।		र्त्य	येत्
5	शून्यं साम्यसमुच्चये	म्य च्व		न्यं
6	अनुरूप्ये शून्यमन्यत् ।	न्य न्य प्ये		न्यत्
7	संकलनव्यवकलनाभ्याम् ।	व्य		भ्याम् सं
8	पूरणापूरणाभ्याम् ।			भ्याम्
9	चलनकलनाभ्याम् ।			भ्याम्
10	यावदूनम् ।			नम्
11	व्यष्टिसमष्टिः ।	व्य	ष्टि	ष्टिः
12	शेषाण्यङ्केन चरमेण ।	ण्य ङ्के		
13	सोपान्त्यद्वयमन्त्यम् ।		न्त्य न्य	न्त्यम्
14	एकन्यूनेन पूर्वेण ।	न्यू वै		
15	गुणितसमुच्चयः	च्च		यः
16	गुणकसमुच्चयः ।	च्च		यः
	Total (37)	17	5	8 + 8

Conclusion

Unified feature because of dimensional synthesis operation is the specific overbuilt over the sets with a pair of operations being availed in work with by non Vedic Mathematics.

Unified State TCV and Sathapatya

Ganita Sutras and Upsutras integrate to unify the mathematical domain in such a way that, the system does not remain porous and becomes of a unified feature of

smooth sequential transition, from one phase to other and to integrate entire mathematical domain / basis base mathematics / Vedic mathematics of Vedic knowledge systems to be parallel with the existence phenomenon in its entirety as well as in its specific expressions.

Ganita Upsutra 4, as it stand in isolation, make specific as that the powers 'are to be only uptill 7 (केवलैः सप्तकमं गुणात्)' from 8th power onwards, the things that unified in such a way that vowels, TCV (स्वर) = 15 becomes the unified TCV of all vowels as 15.

All consonants with TCV (व्यञ्जन) = 29 as unified TCV of all consonants. Pair of consonants become of unified TCV (29, 29) = 31. Three consonants unified TCV (29, 29, 29) = 6.

Unified TCV of vowel with yama is TCV (स्वर, यम) = 15 + 12 = 27 all vowels with yama are of unified TCV value 27.

Here below is the tabulation of above features of unified TCV values.

Table of unified TCV values

Serial number	Letter	Unified TCV
1	स्वर with यम Vowel with Yama	27
2	स्वर Vowel	15
3	एक व्यञ्जन Single consonant	29
4	दो व्यञ्जन Pair of consonants	31
5	तीन व्यञ्जन Triple consonants	6
6	Syllable of one consonant one vowel with yama	29 + 15 + 12 = 56

7	Syllable of two consonant one vowel with yama	$31 + 15 + 12 = 58$
8	Syllable of three consonants one vowel with yama letters	$6 + 15 + 12 = 33$
9	Syllable with one consonant and one vowel	$29 + 15 = 44$
10	Syllable with two consonant and one vowel	$15 + 31 = 46$
11	Syllable with three consonant and one vowel	$6 + 15 = 21$
12	न्यम् Syllable with four consonants and one vowel	$10 + 15 = 25$

C0 (unified TCV)	C1 (Sathapatya)
6 = (three consonants 29, 29, 29)	H2
10 = (four consonants 29, 29, 29, 29)	H3
15 = (one vowel)	h 4
21 = (one vowel with yama)	h 5 $\frac{1}{2}$
25 = one vowel and four consonants	h 6 $\frac{1}{2}$
27 = one vowel and one consonant	h 7
29 = One consonant	h 7 $\frac{1}{2}$
31 = two consonant (29, 29)	h 8 $\frac{1}{2}$
33 = three consonant (one vowel with yama letter)	h 10 $\frac{1}{2}$
44 = one consonant and one vowel	D13
46 = two consonant and one vowel	H12
56 = one consonant and one vowel with yama letter	D16
58 = two consonant and one vowel with yama letter	H15

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