



SACCHIDANANDA SAMARTHA SADGURU SHRI SAINATHA KRIPA

INDIAN GENIUS IN TĀLAPRASTĀRA

ĀKELĀ MALLIKĀRJUNA ŚARMA

Violinist,

Retd. Principal, Govt. College of Music & Dance,
Hyderabad, Andhra Pradesh.

SAI SANNIDHI SANGITA PUBLICATIONS,
10-283/9/1/1, Vasantapuri Colony (VPC-200), Malkajgiri,
HYDERABAD-500 047, Andhra Pradesh.



INDIAN GENIUS IN TĀḶAPRASTĀRA

by Akella Mallikarjuna Sharma

© Akella Mallikarjuna Sharma

No part of this publication may be reproduced
or transmitted in any form or by any means
without the written permission of the author.

First Edition, 2001.

Price: Rs. 300/- US \$ 20 (Packing & postage extra)

Laser type setting & printing by :
Kaanthi Computer Data Systems,
Somajiguda, Hyderabad-500 082.
Ph: 040-2340 2010

Other works of this author :

- * *Talaprastara Ratnakaramu (Telugu)*
- * Talaprastara of Nihshanka
Sharngadeva's Sangita Ratnakara (English)
- * *Sangita Svararaga Sudha (Telugu/English)*
- * *Systematisation of Talaprastara Details
of Deshi Talas (English)*

"Mahāmahōpādhyāya, Rāṣṭrabhūṣaṇa"
Dr. R. Sathyanārāyaṇa, M.Sc., Ph.D., D.Litt.,
D.Litt. (Hon.), F.R.A.S., M.S.A.,
I.C.T.M., F.A.S.I., F.A.M.R.

Phone : (0821) 567891
Trayi Lakṣmi, 9th Cross,
Jayanagar, MYSORE - 570 014,
India.
Date : 01-03-2001

FOREWORD

Every culture may be finally analysed into an irreducibly small number of concepts and values which distinguish it from its compeers. The multiple modes of expression of a given culture are alternative routes to its self expression and result by the variation, recurrence and permutation of the self same concepts and values at different points in the spatiotemporal co-ordinates of the culture. These last therefore operate in every such mode of expression at two levels : 1) in their foundational, original form at the roots and 2) in their transformed forms which are immediate to the specific expression at the level of stimulation, motivation and articulation. Thus its theory consists of a never-changing infrastructure and an ever-changing superstructure. Music, like all art is a growing, dynamic organism. Its discipline is descriptive, not prescriptive.

In any discipline involving human endeavour, the aim of theory is to provide a matrix and apparatus which 1) comprehends the entirety of practice 2) explains the empirical data, facts, functioning and techniques underlying such practice and 3) predicts future events and trends. This is true of the arts also. Art experience, in its autonomy can neither be translated nor extrapolated. But the different art reveal some common attributes in their symbolic material and in their modi operandi. Also, in its heteronomy, art experience is ramified into several aspects and disciplines. Therefore, the study of such experience admits of a reductionistic analysis and an interdisciplinal approach.

Among the many interdisciplinal correlates of music, mathematics and metre (prosody) may be mentioned in the context of the present work. Mathematical techniques, especially permutation and combination are found applied in both Saṅgīta and Chandaḥ śāstra in an elaborate and perfected state for well over a thousand years. The genius of these theorists lies in 1) enunciating the rules in an aphoristic, yet lucid and unambiguous style 2) developing schemes of comprehensive, yet compact schemes of tabulation 3) reducing such schemes to the simplest arithmetical operations and 4) revealing highly pragmatic applications for such purely theoretical techniques.

Permutation refers in mathematics to a scheme or tabulation of systematic arrangement of a set of things in every possible order; it also refers to any one such arrangement i.e., any one possible order of arrangement of a given number of things taken from a given number. This has

been known in India as *prastāra* (lit. extension, expansion) from about two thousand years. In metrics (*Chandaḥśāstra*) it signifies a representation or enumeration of all the possible combinations of a certain given number of *laghus* (short syllables) and *gurus* (long syllables) in a metre. Though *prastāra* is a general mathematical concept, it is probable that music borrowed it and its cognate concepts and techniques from metrics. The science of metrics has developed in India six theoretical tools to exact knowledge of the various mathematical aspects of metres under the collective name *Ṣaṭ-pratyaya*. They enable the student to determine the prosodial type to which a given metrical form belongs, its serial number in a scheme of systematic tabulation, the number of meters which are possible or may be derived from each type, their exact forms etc. These tools are *prastāra*, *naṣṭa*, *uddiṣṭa*, *ēka-dvyādi-la-ga-kriya*, *sānkhyana* and *adhvayōga*. Of these, *prastāra* means the expansion of a prototype metrical structure into every possible variation according to principles of permutation. Thus, the vedic metrical prototypes from *ukta* to *utkṛti* containing 1,2,3,4.....26 syllables per each of four feet respectively have 2,4,8,16,32.....67108864 possible different arrangements respectively. *G yatri*, for example with six syllables for foot has sixty-four permutations. Each of these is also called *prastāra*. Prototypes with more syllables than 26 are called *Mālāvṛttas*. Eight kinds of *prastāra* viz., *sūchi*, *mēru*, *patāka*, *samudra*, *viparītasamudra*, *pātāḷa*, *śālmāli* and *viparītaśālmāli* are described in *Chandaḥśāstra*. These are alternative routes to permutation.

ḍ

The method of finding out the actual form or arrangement given its serial number in the tabulation is called *Naṣṭa*. For example, which is the metre corresponding to serial number 355799 (out of a total of 10458576) in the prototype *Kṛtichandas* (containing 20 syllables per foot). *Na ṣṭa* enables to find out that it is composed of *gllglglllglgllglglg* (l=*laghu*, g=*guru*) i.e., the *Utpalamāla* metre. *Uddiṣṭa* *pratyaya* is the reverse of this. It enables us to find out the serial number of the metre in the tables if its composition is given. Thus, if the foregoing composition of *Utpalamāla* metre is given, *Uddiṣṭa* enables to find out that its serial number in the *prastāra* tables is 355799. The next two *pratyayas* are classificatory in scope. *Ēka-dvyādi-la-ga-kriya* teaches us to determine the number of permutations in a given prototype containing 1,2,3.....*laghus*. If the total number of syllables is 'n', then the number of permutations containing *gurus* would be correspondingly n-1, n-2, n-3..... Thus, this method enables us to break up the total number of permutations into those containing given numbers of its components. It is thus possible to say that in the *Ushnik* metre (containing 7 syllables per foot) there are metrical structures one each containing all *laghus* or all *gurus*, 7 containing one *laghu* or six *laghus*, 21 containing two or five *laghus* and 35 containing three or four *laghus*, thus totalling 128. This may also be expressed thus : the number of permutations containing 7, 6, 5, 4, 3, 2, 1 or 0 *gurus* or *laghus* are 1, 7, 21, 35, 35,

21, 7 and 1 respectively. Sāṅkhyana pratyaya enables the student to find out the number of permutations of samavṛtta, ardhasama or vi amavṛttas possible in a given prototype, its predecessor or successor. Adhvaya is not, in reality, a pratyaya of metrics but is concerned with spatial computation. It answers the question, assuming uniform spacing in both writing and gaps, what is the space required to write horizontally a given metre?

Indian music is indebted to Chandaḥśāstra for numerous models. The following among others may be mentioned: the concepts and relative proportions of temporal units laghu, guru and pluta; rhythm structures without a tāḷa frame as in tāna in Karnāṭaka music; syllabic triads (Varṇagaṇa) such as ma-gaṇa are employed (mātrāgaṇa) structural units are found used in early and medieval music compositions; elaborate rules were framed for the use of specific single or double gaṇas at the beginning of the composition with promise of desirable fruits and warning of undesirable effects accompanying such usage. Many songs were named after the metre in which they were prescribed to be set e.g., hayalīla, krauncapada, ārya, dvipatha, kalahamsa, tōṭaka, jhampaṭa, paddhādi etc., prastāra techniques are used from very early times in tabulating śuddha and kūṭa tānas, mūrcana, mēlakartas in Karnāṭaka music and in the dēśi-tāḷas. Musicology has adapted corresponding techniques from Chandaḥśāstra to accommodate specific situation and requirements.

In the context of tāḷa only five pratyayas viz., prastāra, saṅkhyā, naṣṭa, uddiṣṭa and pātāḷa are found adequate. Their connotations correspond to those in Samskrīta metrics. A known arrangement of the aṅgas (druta, laghu, guru, pluta and rarely kākāpāda, and in the modern context anudruta) fixed in number and order, is taken as a prototype. The structure and total time span of such a prototype is thus fixed and constant. Permutations of this are then obtained (and tabulated) by systematic replacement of an aṅga (structural unit) by a progressively smaller one until in the final permutation the prototype is reduced to only (an appropriate number of) the lowest aṅga (i.e., druta (in ancient parlance) or anudruta (in modern parlance) in Karnāṭaka music. Theoretical texts have described the following pratyaya varieties; prastāra, saṅkhyā, naṣṭa, uddiṣṭa, pātāḷa, sarvapātāḷa, drutamēru, drutamēru-naṣṭa, drutamēru-uddiṣṭa, laghumēru, laghumēru-naṣṭa, laghumēru-uddiṣṭa, gurumēru, gurumēru-naṣṭa, gurumēru-uddiṣṭa, plutamēru, plutamēru-naṣṭa, plutamēru-uddiṣṭa, saṁyōgamēru, khaṇḍa-prastāra and akhaṇḍa-prastāra. The theory of tāḷaprastāra continued to be actively studied in India till comparatively recently. For instance, Sudhākalaśa adds in 1350 A.D. the prastāra genre called kalita in his Saṅgītōpaniṣatsārōddhāra; Paṇḍarīka Viṭṭhala adds the varieties of pratyaya called mālāprastāra, viparita naṣṭa-uddiṣṭa, drutahāra naṣṭa-uddiṣṭa as well as naṣṭa-uddiṣṭas above and below medial forms in his Nartananirnaya; Lakṣmīnārāyaṇa extends the pratyayas to anudruta and virāma in his

Saṅgītasūryōdaya; Pōlūri Gōvindakavi extends prastāra to the five laghu-jātis in his Tāḷadaśaprāṇapradīpika. Authors such as K.V. Srinivāsa Iyyengār, Taccūr Singarācārya Brothers and Tenugupēṭa Veṅkaṭaramaṇayya in the beginning of the 20th century have revealed familiarity with the tāḷapratyaya.

The Tāḷapratyaya has been transmitted not only in more or less continuous textual tradition as mentioned above, but also in oral tradition. Because of the distancing of the latter from the original perspective, it has been preserved in isolation by individual musicians anonymously. An instance of this is the Late Uppalapāti Ankaiah who preserved the key to prastāra and fortunately taught it to Saṅgīta Vidwān Ākeḷḷa Mallikārjuna Śarma. He thus prevented its passing into oblivion. It would be a service to our musical traditions to find out such persons, bring to light their isolated knowledge, restore it to its total perspective and benefit from such knowledge by contemporisation.

In the pretext of 'melodiousness' and popularity, scholarship in the practice of music is being unfortunately allowed to wane at the present time. Technique, virtuosity and scholarship, when mastered and applied with effortless ease and grace promote excellence and highest creative activity in music. Individual caprice, eccentricity and mannerisms should not be confounded with genius or brilliance. Genius assumes a deep and broad base of profound, continuous, conscious learning which is intensified and sublimated to the subconscious level.

When viewed in the light of the foregoing, the work of Saṅgīta Vidwān Ākeḷḷa Mallikārjuna Śarma gains a special significance. He is a pioneer in the modern studies of tāḷapratyaya and is indeed a genius of our times. With indefatigable zeal, patience and perseverance, with indomitable determination, with a total, single-minded devotion and dedication Śri Śarma has unravelled the mysteries of the tāḷapratyaya in such minute detail that he has been able even to correct some inaccuracies in exposition and fact of great authors of the past. He has clearly shown the enduring relevance of these pratyayas in the form of many applications to the practice of music (and dance). He deserves the congratulation, admiration, respect and gratitude of every one who is interested in the promotion of the highest ideals of Indian music and Indian culture.

Indian culture is a garden; Indian music is a Sanātana Tree therein; the quality and quantity of its flowers and fruits depend on how deep, strong and far-reaching are its roots. Śri Śarma has done much to deepen and strengthen these hoary roots and is worthy of emulation.

I hope that this scholarly work - which needs to be studied slowly, steadily and patiently - will be welcomed with enthusiasm by discerning musicians, musicologists and music lovers.

R. Sathyanārāyaṇa

PREFACE

Fine arts play a very important role in promoting the human culture and progress. They chasten the human minds and help them to lead fuller and happier lives. Life will become dull, insipid, un-interesting and bereft of all charms if fine arts are not allowed to prosper and grow.

Among the fine arts, while the visual arts like painting, sculpture and architecture appeal through the medium of the eye, the poetry and music appeal through the medium of ear.

According to the ancient Sanskrit Ślōka:

“संगीतमपि साहित्यं सरस्वत्यास्तनद्वयं
एकमापात मधुरं अन्यथालोचनामृतं”

"Music and poetry are the two breasts of Saraswati, the Goddess of Learning. Whereas music pleases the moment one hears it, poetry gives pleasure only after one contemplates on it".

Music is the language of emotion. In the history of human culture music is the earliest and finest of the Fine Arts. Music is of universal appeal influencing scholar and the lay person alike. Music is a veritable elixir and has the unique capacity of giving one the much needed tranquility and the mental peace.

Music is both art (Kaḷa) and a science (Śāstra). Its study and practice results in the development of the intellectual and the soul. According to the Ślōka:

“त्रिवर्ग फलदास्सर्वे दानयज्ञ जपादयः
एकंसंगीत विज्ञानं चतुर्वर्ग फलप्रदं”

"gifts, holy sacrifices and prayers lead to the realisation of Dharma, Artha and Kama, the three-fold desires. But musical knowledge alone is capable of bestowing the fruits of all the four Puruṣārthas: Dharma, Artha, Kāma and Mōkṣa" and according to the Ślōka:

“वीणवादन तत्त्वज्ञः श्रुति जाति विशारदः
तालज्ञश्चाप्रयासेन मोक्षमार्गं नियच्छति”

"One who is well-versed in Vīna-play, one who is an adept in varieties of Śrutis and who is an adept in Tāḷa; they all attain salvation without effort".

Music has played great part in the life of the Indian people and has entered the hearts of all people by being the instrument through which religion and philosophy have pervaded the land. Whether in drama, dance or on the concert stage, in the home, in the temples, in the fields and in the lives of the peasant, the king or the householder, music gave richness to our civilisation and culture.

In the systems of music of the world, while the western solfa system had the heritage of nearly 1000 years, the Indian solfa system, being the oldest upon earth, had the heritage of more than 4000 years. The famous Kudimiamālai inscriptions on music were written in 7th Century A.D.

Great musicians carried on their traditions for which we must be grateful to the Indian rulers and other noble men. In South India this tradition has fortunately survived in a greater measure

than any where else in the country because almost every child was taught the beautiful compositions of our great composers and this helped them to appreciate music. Thus, while great musicians, on one hand, strived hard to pass on the cultural heritage of the compositions of great composers to the next generations, great scholars, on the other hand, strived hard to record them in the books written by them to pass on the traditional techniques of the Sacred Fine Art, Music to the next generations.

According to the Saint composer, Tyāgarāja (1767-1847), the first and revered as the greatest of the musical Trinity:

‘‘संगीत ज्ञानमु सारूप्य सौख्यदमेमनसा - मुखारिग - आदिताल’’

--knowledge of the science of music conduces to Bliss Divine. Beethoven (1770-1827), the great composer of Europe called music a revelation higher than all science and philosophy.

The student of mathematics will find the practical application of many of the concepts, series, progressions and formulae of mathematics, in music. The primordial scale of Indian music was found to take notes of correct and well recognised musical intervals. In the same manner there is an order of rhythm in all things pertaining to nature. There is rhythm in the movements of stellar bodies. There is rhythm in the pulse of the hand. In music all the rhythmical forms have been originated on accurate mathematical basis.

It is the duty of every loyal Indian citizen to take proper steps to keep this sacred Fine Art, Music in tact and to pass on to the next generations in the same manner like our ancestors.

While Rāga and Tāḷa are the two main divisions of Indian Music containing its own lakṣaṇa of each the Tāḷa, in its Lakṣaṇa, consists of ten elements which are "Tāḷadaśaprāṇas". Kāla, Mārga, Kriya, Aṅga, Graha, Jāti, Kaḷa, Laya, Yati and Prastāra.

‘‘सर्वेषामपि तालानां प्रस्तारो मातृका मता
तस्मादादौ प्रवक्ष्यामि प्रस्तारं तालवृद्धये’’

As mentioned above by the Jaina Monk, Vācanācārya Sudhākalaśa in his Sanskrit work namely "Saṅgītōpaniṣatsārōddhāra" - 22nd Ślōka-Chapter-II-written in 1350 A.D., among the ten elements the tenth element, Prastāra, though many are not aware of it, is the only source of all the rhythmical forms of universe. In fact, all kinds of rhythmical forms could be obtained only by this element and all these rhythmical forms are having serial numbers of origin and basing upon these serial numbers of origin only the authenticity of any rhythmical form could be identified.

For example in the Tāḷas of Karnāṭaka-music :

41	is the serial number of	Ādi-tāḷa (422),
3	-do-	Rūpaka-tāḷa (24),
21	-do-	Tripata-tāḷa (322),
193	-do-	Jhampa-tāḷa (712) and
3	-do-	Trisra-rūpaka-tāḷa (23)

and in the Tāḷas of Hindustāni-music :

2057	is the serial number of	Tīntāl or Tritāl (484),
1	-do-	Jhaptāl (253),
67	-do-	Dādra(6),
649	-do-	Ēktāl (4422),
517	-do-	Dīptcandi (374),
529	-do-	Damār (554),
547	-do-	Aḍā-cautāl (2444) and
1053	-do-	Gaja-Jhampa (474).

But, while furnishing these serial numbers of Tāḷas, there is every scope of furnishing incorrect serial numbers if the author does not take proper care by checking them thoroughly. So, to avoid the embarrassment of furnishing any incorrect serial number for any Tāḷa, many authors of books on music have very conveniently skipped off these serial numbers but furnished many Tāḷas of their own fancy even without any serial numbers which lead to the different versions of Tāḷāṅgas for a single Tāḷa and vice-versa.

In the annals of our music literature Pārśvadēva of 13 century was the first person to furnish serial numbers for nearly 50 Tāḷas (furnished in the end of this book) in his book, "Saṅgītasamayāsāra(Sanskrit)" out of which 10 numbers are found incorrect. The second book is "Gāyakalōcanam (Telugu)" written and published in 1902 by Taccūr Siṅgarācārya Bros., in which around 160 Tāḷas (furnished in the end of this book) are furnished along with new names, serial numbers and Tāḷāṅgas out of which around 50 numbers are found incorrect. The incorrectness of these above serial numbers is found with the help of the easy method "Uddiṣṭa" of this element, Prastāra. In all other books no such serial numbers are furnished and in the absence of these serial numbers there is no scope of determining the authenticity of any Tāḷa cited in them.

In 1957, having come across several tables with figures in the Tāḷa chapter of "Gāyakalōcanam", even without any definitions, and somehow guessing, by intuition, the latent treasure thereof I had a deep desire to bring out, what had been hitherto in dark, into light with indefatigable spirit. My pursuit since 1957 to find a person having profound knowledge in this subject, ended successfully in 1963 when I found an exponent on this chapter of Tāḷa in Late Uppalapāṭi Aṅkaiah who was my colleague. He expressed his deep anguish for not having cared and bestowed any interest to learn much more about this in his teens from his father who could taught him only different modes of permutation of Tāḷa-prastāra. He was very kind enough to teach me the various modes of permutation and affectionately showered his blessings upon me for my success in this Himālayan task of expounding all the hidden clues of this element. Later, though I have gone through many of the ancient and recent publications written in Sanskrit, Telugu, Tamil, Hindi and English wherein, unfortunately, no clues were revealed clearly, I was unable to understand even one hundredth of the original matter; but in my continued research, only by the grace of the Almighty, the top clue of "NAṢṬA" flashed in my mind on 6-9-1969 and then after all the other clues followed suit.

I am very grateful to Late Prof. P.Sāmbamūrty who advised me to compile my research papers into the form of a book and also blessed me with an invaluable Fore-word to the first Telugu version, 'Tāḷaprastārasāgara'.

I am thankful to Śrī Dwāram Bhāvanārāyaṇa Rāo, who had very carefully gone through this book with great interest and enthusiasm and gave his precious opinion to the Telugu version.

I shall ever be grateful to :

Late Uppalapāṭi Aṅkaiah, my beloved Guru in this subject.

My beloved parents Late Ākeḷḷa Aswatthanārāyaṇa Mūrty and Smt. Kanakam who taught me this Sacred Fine Art, Music and encouraged me.

My wife, Chi. Sow. Ākeḷḷa Kāmēśwari, for her inspired co-operation given althrough my extensive research work.

Sri Cherukupally Pūrṇānanda Śarma for the pains taken in giving a shape to this book both in Telugu and English versions.

Sri K.L.Nārāyaṇa and Śrī M.S.N. Śarma for their co-operation in translating the Prastāra portion of Saṅgīta Ratnākara,

"Mahāmahōpādhyāya, Raṣṭrabhūṣaṇa" Dr. R.Sathyanārāyaṇa, the internationally reputed musicologist, who has incessantly been extending his very kind helping hand in so many ways like coining the title in English for this work as 'Permutative genius in Tāḷa (-prastāra) in Indian Music', consenting to include his English translation of Nartananirṇaya in this book, writing the 'Foreword' with his unfathomable depth of knowledge etc., which I could never forget and

In compliance to Late Prof. P.Sāmbamūrthy's advice I could compile my research material on this topic in the form of a book during 1970 itself. But, since then, I have been adding on much more valuable material obtained in my research re-writing and re-tuning this book in 1974, 1982, 1984, 1985 (the year of publication of the first Telugu version by A.P. Sangeeta Academy) 1987, 1988, 1989, 1992 (the year of publication of the first English version by the Telugu University, Hyderabad) 1995, 1997, 1998, 1999, 2000 and 2001.

Any lapses occurred in course of explaining this unfamiliar and intricate subject may kindly be adjudged with an open mind and intimated to me for correction in the next edition.

I happily welcome those persons who inform and enlighten me about points relating to this element, Prastāra, if any, for incorporating them in the future editions.

Hyderabad
Date : 01-06-2001

Ākeḷḷa Mallikārjuna Śarma
Author

PROLOGUE

In our ancient books on Music ten elements are mentioned in the Tāḷa-chapter and they are 1.Kāla 2.Mārga 3.Kriya 4.Aṅga 5.Graha 6.Jāti 7.Kaḷa 8.Laya 9.Yati and 10.Prastāra. In this book, I intend to deal with the tenth element i.e., Prastāra, giving, however, brief definitions of the remaining nine elements about which some differences of opinion are prevailing.

To define briefly, Prastāra means the process of making different permutations and combinations of the Tāḷāṅgas on a systematic basis, avoiding iteration. Categorising according to the number of Aṅgas utilised in the process of the permutation, there are two kinds of modes of permutation mentioned in the ancient treatises. They are 1.Caturaṅga-prastāra in which only four Aṅgas, namely Druta, Laghu, Guru and Pluta are used in the process of permutation of the Aṅgas pertaining to Caturaśra-jāti only and 2.Pañcāṅga-prastāra where in only five Aṅgas, namely Anudruta, Druta, Laghu, Guru and Pluta are used in the process of permutation of the Aṅgas other than Caturaśra-jāti. In those days Kākapāda was forbidden from usage, it being an Aṅga to be rendered without producing any sound. But this omission does not seem reasonable as the then authors themselves have mentioned in their books Tāḷas like Siṃhanandana having 128-units which includes one Kākapāda, Prithvikunḍali having 268-units including two Kākapādas, Indrakunḍali having 384 units including one Kākapāda and also some other Tāḷas along with Kākapāda. As such, keeping the mathematical importance of Kākapāda in view, this is now included in the processes of Caturaṅga and Pañcāṅga-prastāras and thus transformed Pañcāṅga and Ṣaḍaṅga-prastāras respectively only are prescribed in this book. Details are worked out and given applying Pañcāṅga-prastāra to the Aṅgas of only Caturaśra-jāti and Ṣaḍaṅga-prastāra to the Aṅgas of all Jātis including Caturaśra-jāti. Apart from these kinds of modes of permutation another mode of permutation called 'Saṃyuktāṅga-prastāra' which is of recent past and so vast that in addition to all the permutations derived in the processes of Pañcāṅga and Ṣaḍaṅga-prastāras, innumerable other permutations also derive in the process of this permutation, is also furnished, (Now, this is being called 'Ṣoḍaśāṅga-prastāra', but it is not correct. This name 'Ṣoḍaśāṅga-prastāra' is proper if this process of permutation is applied to the Aṅgas pertaining to Caturaśra-jāti only; and this name should have to be changed whenever the Jāti is changed. The correct name of this mode of permutation is 'Saṃyuktāṅga-prastāra' as interlaced Aṅgas written one above the other are also used in this process of permutation).

The figures of all the different tables in this book are worked out upto 12-units and furnished. If necessary, further figures may be obtained following the respective procedure.

To make this very rare and complicated topic easy to the readers a number of examples are furnished in detail wherever necessary. The vital aspects, Naṣṭa, Uddiṣṭa and Kalita, of this element, which are very interesting and useful at all times and which have never been elaborated clearly in any book, are furnished in detail, with the help of more than hundred different examples to make them easy to understand, digest, assimilate, remember and follow to the reader. For ready reference

the Sanskrit versions of the relevant portions of prastāra pertaining to Saṅgīta Ratnākara (97 Ślōkas starting from 312th to 408th of Tāḷādhyāya) and Nartananirṇaya (35 Ślōkas starting from 196th to 230th of Tāḷaprakaraṇa) are also furnished in this book along with free English translation and the major reforms made accordingly by the author in the different old texts.

In the annals of music literature, till now, only two books, Saṅgītasamayāsāra (12th century) and Gāyakalōcanam (1902), in which serial numbers, having natural link with the series of Aṅgas, are furnished, are found. Those Tāḷas also are furnished in this book along with the correct versions, wherever necessary.

UTILISATION : This element of prastāra is highly useful for not only percussionists but also vocalists and instrumentalists. This helps the musicians to prove the authenticity of any rhythmical form with the help of its serial number and in obtaining all the different mathematical combinations to use them in practical music. There are two kinds of prastāras:

1. Prastāras having scientific origin which can also be rendered (all the Tāḷas having the same value of Jāti for all the constituent Aṅgas and devoid of Saṁyuktāṅgas come under this category. Example : 35 Tāḷas etc.).

2. Prastāras having scientific origin but cannot be rendered (all the prastāras containing Saṁyuktāṅgas also in combination with two or more Aṅgas like Druta-virāma or Laghu-druta or Pluta-laghu-druta-virāma or Kākapāda-dvi-druta etc., written one above the other and also having different value of Jāti for the constituent Aṅgas, come under this category. Example : Śarabhanandana Tāḷa etc.).

In Saṁyuktāṅga-prastāra in the process of permutation of an Aṅga of sixteen-units (Kākapāda-laghu-virāma of Trisra-jāti-3; Kākapāda of Caturaśra-jāti-4; Pluta-virāma of Khaṇḍa-jāti-5; Guru-dvi-druta of Divya-saṅkīrṇa-jāti-6; Guru-druta of Miśra-jāti-7; Guru of Miśra-saṅkīrṇa-jāti-8; Laghu-tri-druta-virāma of Saṅkīrṇa-jāti-9; Laghu-tri-druta of Dēśya-saṅkīrṇa-jāti-10; Laghu-dvi-druta of Miśra-dēśya-saṅkīrṇa-jāti-12; Laghu of Dēśya-śuddha-saṅkīrṇa-jāti-16-either of them pertaining to 16-units only) 32,768 varieties of prastāras only derive and they include the prastāras 6595 of Caturaśra-jāti pertaining to Pañcāṅga-prastāra, 12975 of Trisra-jāti 5294 of Caturaśra-jāti, 3221 of Khaṇḍa-jāti, 2412 of Divya-saṅkīrṇa-jāti, 2031 of Miśra-jāti, 1834 of Miśra-saṅkīrṇa-jāti, 1727 of Saṅkīrṇa-jāti, 1668 of Dēśya-saṅkīrṇa-jāti, 1617 of Miśra-dēśya-saṅkīrṇa-jāti and 1598 of Dēśya-śuddha-saṅkīrṇa-jāti pertaining to Ṣaḍaṅga-prastāra. It will be interesting and colourful if some of these varieties of rhythmical forms are translated and sung in Swara-improvisations. Some examples of them are furnished here.

In each of the following combinations the series of units is furnished in the first line along with its serial number in the right extreme, the corresponding Mrdaṅga-jāti in the second line which could be repeated thrice to utilise it as 'Muktāyi or Tihāi' and the corresponding notation in the last three lines which could be sung in Swara-improvisation.

APPLICATION OF THE COMBINATIONS :

The notation of the following combinations is set to Sama-graha Pallavi of the Kṛiti "Sarōjadaḷanētri-Śankarābharaṇa-rāga-ādi-tāḷa-Śyāmaśāstry" in which each one of them starts from the 5th Kriya in the medium tempo and starts from the 3rd Kriya in slow tempo.

In the series of units :

- '1' denotes Anudruta,
- '2' denotes Druta,
- '3' denotes Laghu of Trisra-jāti or Druta-virāma of other remaining jātis,
- '4' denotes Laghu-virāma of Trisra-jāti or Laghu of Caturaśra-jāti or Dvi-druta of other remaining jātis and
- '5' denotes Laghu-druta of Trisra-jāti or Laghu-virāma of Caturaśra-jāti or Laghu of Khaṇḍa-jāti or Dvi-druta-virāma of other remaining jātis.

In Mṛidaṅga-jāti : 't' should be pronounced as 'ta'(त); 't' as 'ṭa'(ट); 'k' as 'ka'(क); 'k' as 'ki'(कि); and 'd' as 'dhi'. (धि)

In notation :

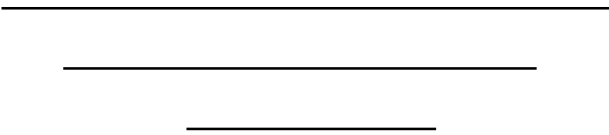
- 's' stands for 'sa' (स)
- 'r' stands for 'ri or re' (रि वा रे)
- 'g' stands for 'ga' (ग)
- 'm' stands for 'ma' (म)
- 'p' stands for 'pa' (प)
- 'd' stands for 'dha' (ध) and
- 'n' stands for 'ni' (नि)
- 's' carries '1-unit' and 'S' '2-units' of time

1. 3 3 3 2 - 1 1 1 1 1 - 32037
t; d; t; d, t k t k t
ǵ; ř; ś; n, ǵ ř ś n d
ř; ś; n; d, ř ś n d p
ś; n; d; p, g m p d n
2. 1 2 - 1 2 - 1 2 - 2 - 1 1 1 1 1 - 32110
t d, t d, t d, t, t k t k t
ǵ ř, ś n, d p, d, ǵ ř ś n d
ř ś, n d, p m, p, ř ś n d p
ś n, d p, m g, m, g m p d n
3. 1 2 - 1 2 - 1 2 - 1 2 - 1 2 - 1 - 23406
t d, t d, t d, t d, t d, t
r s, g r, m g, p m, d p, m
g r, m g, p m, d p, n d, p
m g, p m, d p, n d, ś n, ř
4. 1 1 1 - 1 1 1 - 1 1 1 - 1 1 - 1 1 1 1 1 - 32768
t k t t k t t k t t k t k t k t
ǵ ř ś ř ś n ś n d n d ǵ ř ś n d
ř ś n ś n d n d p d p ř ś n d p
ś n d n d p d p m p m g m p d n
5. 1 1 3 - 1 1 1 3 - 1 1 1 1 1 - 31988
t k d; t k t d; t k t k t
ǵ ř ś; ǵ ř ś n; ǵ ř ś n d
ř ś n; ř ś n d; ř ś n d p
ś n d; ś n d p; g m p d n
6. 1 1 1 2 - 1 1 1 1 2 - 1 1 1 1 1 - 32248
t k t d, k t t k d, t k t k t
g m p m, r g m p m, s r g m p
m p d p, g m p d p, r g m p d
p d n d, m p d n d, g m p d n
7. 1 1 1 1 1 2 - 1 1 1 1 2 - 1 1 1 - 30688
t k t k t d, k t t k d, t k t
r g m p d p, g m p d p, g m p
g m p d n d, m p d n d, m p d
m p d n ś n, p d n s n, p d n

8. 1 2 - 1 1 2 - 1 1 1 2 - 1 1 1 1 - 31710
t d, t k d, t k t d, k t t k
p d, m p d, g m p d, r g m p
d n, p d n, m p d n, g m p d
n ś, d n ś, p d n ś, m p d n
9. 1 1 1 1 2 - 1 1 1 2 - 1 1 2 - 1 - 24048
k t t k d, t k t d, t k d, t
r g m p d, g m p d, m p d, p
g m p d n, m p d n, p d n, d
m p d n ś, p d n ś, d n s, n
10. 1 1 5 - 1 1 5 - 1 1 - 25028
t k d;; t k d;; t k
r g m;; g m p;; m p
g m p;; m p d;; p d
m p d;; p d n;; d n
11. 1 1 1 4 - 1 1 1 4 - 1 1 - 25544
t k t d;; t k t d;; t k
s r g m;; r g m p;; m p
r g m p;; g m p d;; p d
g m p d;; m p d n;; d n
12. 2 1 1 2 - 2 1 1 2 2 1 1 - 27567
d, t k d, d, t k d, d, t k
s, r g m, r, g m p, g, m p
r, g m p, g, m p d, m, p d
g, m p d m, p d n, p, d n
13. 1 1 1 1 2 - 1 1 1 1 2 - 1 1 1 1 - 31728
k t t k d, k t t k d, k t t k
p m g r g, d p m g m, r g m p
d p m g m, n d p m p, g m p d
n d p m p, ś n d p d, m p d n
14. 1 1 2 - 1 1 1 1 2 - 1 1 1 1 1 1 - 32508
t k d, k t t k d, t k k t t k
g m p, g r g m p, m g r g m p
m p d, m g m p d, p m g m p d
p d n, p m p d n, d p m p d n

15. 1 1 1 1 1 1 2 - 1 1 1 1 2 - 1 1 - 28608
t k k t t k d, k t t k d, t k
g r s r g m p, s r g m p, m p
m g r g m p d, r g m p d, p d
p m g m p d n, g m p d n, d n
16. 3 2 - 3 2 - 3 2 - 1 - 21141
d; t, d; t, d; t, t
g; r, m;g, p; m, p
m;g, p; m, d; p, d
p; m, d; p, n; d, n
17. 2 3 - 2 3 - 2 3 - 1 - 19027
t, d; t, d; t, d; t
g, r; m,g; p, m; p
m, g; p, m; d, p; d
p, m; d, p; n, d; n
18. 2 1 2 - 2 1 2 - 2 1 2 - 1 - 23255
d, t d, d t d, d, t d, t
s, g r, r, m g, g, p m, p
r, m g, g, p m, m, d p, d
g, p m, m, d p, p, n d, n
19. 1 2 2 - 1 2 2 - 1 2 2 - 1 - 22198
t d, t, t d, t, t d, t, t
s g, r, r m, g, g p, m, p
r m, g, g p, m, m d, p, d
g p, m, m d, p, p n, d, n
20. 1 1 3 - 1 1 3 - 1 1 3 - 1 - 20084
t k d; t k d; t k d; t
s g r; r m g; g p m; p
r m g; g p m; m d p; d
g p m; m d p; p n d; n
21. 1 1 1 2 - 1 1 1 2 - 1 1 1 2 - 1 - 24312
t k t d, t k t d, t k t d, t
s g r r, r m g g, g p m m, p
r m g g, g p m m, m d p p, d
g p m m, m d p p, p n d d, n

22. 1 1 1 4 - 1 1 4 - 1 1 1 - 29128
, t k d;, t k d;, t k t
, s r g;, r g m;, g m p
, r g m;, g m p;, m p d
, g m p;, m p d;, p d n
23. 1 1 1 1 3 - 1 1 1 3 - 1 1 1 - 29648
, t k t d; t k t d; t k t
, s r g m; r g m p; g m p
, r g m p; g m p d; m p d
, g m p d; m p d n; p d n
24. 1 1 1 2 2 - 1 1 2 2 - 1 1 1 - 30168
, t k d, d, t k d, d, t k t
, s r g, m, r g m, p, g m p
, r g m, p, g m p, d, m p d
, g m p, d, m p d, n, p d n
25. 1 1 1 1 1 1 - 1 1 1 1 1 - 1 1 1 1 1 - 32768
, t k t k t t k t k t t k t k t
, s r g m p r g m p d g m p d n
, r g m p d g m p d n m p d n ś
, g m p d n m p d n ś p d n ś t



IMPORTANT TECHNICAL - TERMS, ABBREVIATIONS & SIGNS

1. 'A' - 'U' - Anudruta	-	AP	-	Anudruta-permutation
or		AEP	-	Anudruta-ending-permutation
'𑀅'		ADP	-	Anudruta-devoid-permutation
		ACP	-	Anudruta-containing-permutation
		AAEP	-	All-anudruta-ending-permutation
2. 'D' - 'O' - Druta	-	DP	-	Druta-permutation
		DEP	-	Druta-ending-permutation
		DDP	-	Druta-devoid-permutation
		DCP	-	Druta-containing-permutation
		ADEP	-	All-druta-ending-permutation
3. 'L' - 'I' - Laghu	-	LP	-	Laghu-permutation
		LEP	-	Laghu-ending-permutation
		LDP	-	Laghu-devoid-permutation
		LCP	-	Laghu-containing-permutation
		ALEP	-	All-laghu-ending-permutation
4. 'G' - 'S' - Guru	-	GP	-	Guru-permutation
		GEP	-	Guru-ending-permutation
		GDP	-	Guru-devoid-permutation
		GCP	-	Guru-containing-permutation
		AGEP	-	All-guru-ending-permutation
5. 'P' - 'Ṣ' - Pluta	-	PP	-	Pluta-permutation
		PEP	-	Pluta-ending-permutation
		PDP	-	Pluta-devoid-permutation
		PCP	-	Pluta-containing-permutation
		APEP	-	All-pluta-ending-permutation
6. 'K' - '𑀓' - Kākapāda	-	KP	-	Kākapāda-permutation
		KEP	-	Kākapāda-ending-permutation
		KDP	-	Kākapāda-devoid-permutation
		KCP	-	Kākapāda-containing-permutation
		AKEP	-	All-kākapāda-ending-permutation
7.		UEP	-	Unit(s)-permutation
		UEP	-	Unit(s)-ending-permutation
		UDP	-	Unit(s)-devoid-permutation
		UCP	-	Unit(s)-containing-permutation

8. IAEP:- Identical-aṅga-ending-permutation
9. BL:- Proxies of the bottom line
10. ILL:- Proxies of the immediate lower line
11. UL:- Proxies of the upper line
12. SL:- Proxies of the same line
13. 'S':- Saṅkhyā:- The total number of prastāras obtained in the process of permutation.
14. 'M' :- Mahāpātāḷa :- The total number of Aṅgas used in the process of permutation.
15. SM-figure:- The total of the figures of both Saṅkhyā and Mahāpātāḷa together.
16. SF:- In Pañcāṅga, Ṣaḍaṅga and Saṁyuktāṅga-prastāras Druta, Anudruta and figure '1' are the inferior (least) ones respectively and all the remaining are superior ones. In a series of Aṅgas of a prastāra the inferior Aṅgas are originated by the un-deducted figures of Saṅkhyā. The total of the figures of Saṅkhyā which are successfully subtracted and originated superior Aṅgas is called 'Superiors' - figure', and this is used in Uddiṣṭa.
17. MN- The exact middle number of the prastāras for the odd-number of Saṅkhyā and the Anulōma-serial-number of the prastāras of the last prastāra of the first - half for the even - number of Saṅkhyā is called the prastāra of the 'Midmost-number or mid - number (MN)' and this should always be excluded while counting the upper or lower numbers of prastāras of the MN. This is of two kinds and they are :
 - (i) Madhyarūpa-uparisthita: the prastāra above the MN.
 - (ii) Madhyarūpa-adhaḥsthita: the prastāra below the MN.
18. Prastāra :- Process of permutation.
19. Caturaṅga - prastāra :- Quadrivalent - permutation
20. Pañcāṅga - prastāra :- Pentavalent - permutation
21. Ṣaḍaṅga - prastāra :- Hexavalent or Sexivalent - permutation
22. Saṁyuktāṅga - prastāra :- Synaptic - permutation
23. Akhaṇḍa - prastāra :- General - permutation
24. Khaṇḍa - prastāra :- Divisional - permutation
25. Hīna - prastāra :- Devoid - permutation
26. Yukta - prastāra :- Containing - permutation
27. Anulōma - prastāra :- Obverse - permutation
28. Vilōma - prastāra :- Reverse - permutation
29. General-key-rule: While writing 'Saṅkhyā' of all the tables of general permutation and for the lowest-lines of all the tables of Aṅgas of divisional permutation figure '1' should invariably be written to the left of the extreme left house.
30. Proxies :- In this element of Prastāra several tables containing figures are to be written which furnish the details of various innumerable prastāras obtained in the process of permutation. But to avoid the laborious process of permutation, certain easy methods are explained to write these figures basing upon the figures of particularly specified preceding houses (but not of the succeeding houses at all), which classify and represent the Anudruta-ending-permutations (AEPs), Druta-ending-permutations (DEPs), Laghu-ending-permutations (LEPs) and so on, thus classifying the prastāras basing upon the Tāḷāṅgas

remaining in the extreme right of each prastāra. The numbers of these specified preceding houses, which here-in-after are called 'PROXIES', play an indispensable role in this element.

In Pañcāṅga-prastāra where in only five Tālāṅgas ie., Druta, Laghu, Guru, Pluta and Kākapāda are used in the process of permutation, there are only five 'Proxies' viz., 1,2,4,6 & 8 representing the respective Aṅga-ending-permutations of the above five Aṅgas respectively (it may be noted that Aṅgas pertaining to Caturaśra-jāti only could be permuted in Pañcāṅga-prastāra wherein Druta is the least Aṅga) and in Ṣaḍaṅga-prastāra wherein all the six Aṅgas i.e., Anudruta, Druta, Laghu, Guru, Pluta & Kākapāda are used in the process of permutation the six 'Proxies' representing the respective Aṅga-ending-permutations of these above six Aṅgas are :-

1- 2 - 3 - 6 - 9 - 12 -	for Trisra-jāti,
1 - 2 - 4 - 8 - 12 - 16 -	for Caturaśra-jāti,
1 - 2 - 5 - 10 - 15 - 20 -	for Khaṇḍa-jāti,
1 - 2 - 7 - 14 - 21 - 28 -	for Miśra-jāti and
1 - 2 - 9 - 18 - 27 - 36 -	for Saṅkīrṇa-jāti and

in Saṁyuktāṅga-prastāra, where in addition to these above six Aṅgas, the other synaptic Aṅgas are also used, all the preceding consecutive houses are 'Proxies'. While 1&2 are common to all modes of permutation it should be remembered that in Pañcāṅga-prastāra all the remaining proxies are multiples of '2', in Ṣaḍaṅga-prastāra, all the remaining proxies are the multiples of '3' in Trisra-jāti, '4' in Caturaśra-jāti, '5' in Khaṇḍa-jāti, '7' in Miśra-jāti and '9' in Saṅkīrṇa-jāti and in Saṁyuktāṅga-prastāra all the numbers serially and consecutively are the 'Proxies' and always the specific mention of these above figures, '2,3,4,5,7,9 & 1' indicates the relation of the concerned respectively. If needed the relevant details of all other Viśeṣa-jātis, Divya-saṅkīrṇa-jāti (6), Miśra-saṅkīrṇa-jāti (8), Dēśya-saṅkīrṇa-jāti (10), Miśra-dēśya-saṅkīrṇa-jāti (12) and Dēśya-śuddha-saṅkīrṇa-jāti (16) could also be obtained basing upon the multiples of their respective proxies in the same manner.

31. Un-deducted proxy : This is of two kinds.

(a) At the starting point of the process of deducting the respective proxies, either in the beginning or in the middle of the process, if any proxy could not be subtracted from the remainder, being a figure bigger than the remainder, such figure is called the 'un-deducted-proxy' (udp-Apatita-अपतित), by which we always get the least Aṅga only.

(b) Immediately, after a successful subtraction of a proxy, if the immediate next consecutive proxy is not subtracted from the remainder, being a figure bigger than the remainder, such figure is called the 'left-off-proxy' (lop-Visarjita-विसर्जित), by which we will not get any Aṅga at all.

32. Indicative figures of the examples : In this book while furnishing the examples of various problems of Naṣṭa, Uddiṣṭa and Kalita, several questions relating to different permutations are furnished along with their respective methods of answering them to make all these problems easy to understand. Application of these figures pertaining to those permutations are given here under :

Akhaṇḍa- prastāra (Nos. of the figures)	Khaṇḍa- prastāra	Particulars
1	1	Indicative number of the mode of permutation (i.e., 2,3,4,5,7,9 & 1)
2	2	Unit-value of the permutation in figures
—	3	Proxy-number of the table concerned which represents the respective Aṅga
—	4	Devoid or containing numbers of the respective Aṅgas
3	5	Saṅkhya
4	6	Serial numbers of the prastāra for Naṣṭa or Kalita

OR

Series of the Aṅgas of the prastāra for Uddiṣṭa

Example : Akhaṇḍa-prastāra :- 2-12-632-1--- Among them the first figure '2' represents the Pañcāṅga-prastāra, the second figure '12' represents the 12-Druta-permutation, the third figure '632' represents the respective Saṅkhya and the last figure '1' represents the 1st prastāra,

Khaṇḍa-prastāra :- 2-12-1-0-29-12----- Among them, the first figure 2, as above, indicates the Pañcāṅga - prastāra, the second figure '12', as above, indicates the 12-Druta-permutation, the third figure '1' indicates the first-proxy of Druta, the fourth figure '0' indicates the Druta-devoid-permutations, the fifth figure '29' indicates the Saṅkhya of the Druta-devoid-permutations of 12-DP and the sixth figure '12' indicates the 12th prastāra.

33. Groups of combinative Aṅgas :- In the table of the combinative Aṅgas vertical lines should be drawn to each of the independent Aṅgas and also to the combinations of two, three, four, five and six Aṅgas. In respect of these groups of combinative Aṅgas while there are '1' group ending with Druta, '2' with Laghu, '4' with Guru, '8' with Pluta and '16' with Kākapāda, thus doubling each time making a total of $(1+2+4+8+16=)$ '31' pertaining to the Pañcāṅga-prastāra there are '1' group ending with Anudruta, '2' with Druta, '4' with Laghu, '8' with Guru, '16' with Pluta and '32' with Kākapāda, thus doubling each time making a total of $(1+2+4+8+16+32=)$ '63' pertaining to the Ṣaḍaṅga -prastāra. This total number varies each time in respect of Saṁyuktāṅga prastāra depending upon the requirement of units. These details are furnished in the 'List of Combinative-aṅgas' of this book.
34. '—' :- In the places needed the figures of the lower lines are indicated with a small horizontal (-) line beneath the figure.
35. Anulōma and Vilōma serial numbers:- In order to obtain the corresponding serial number from Anulōma-serial-number to Vilōma-serial-number or vice-versa of Saṅkhya, subtract the question number of the prastāra from the respective Saṅkhya and add figure '1' to the remainder.
36. Aṅgas and figures:- To make the matters more easier to the reader to follow and understand, the details of Saṁyuktāṅga-prastāra are furnished in terms of figures which could be transliterated into Aṅgas if needed.



CONTENTS

	Page
Fore-word by Dr.R. Sathyanārāyaṇa	i
Preface	v
Prologue	v
Important technical terms, abbreviations & signs	xvi
Contents	xx
List of Tables, Diagrams etc.,	xxii

CHAPTER-1 TEN ELEMENTS OF TĀĻĀ

1.1	Kāla	...	...	1
1.2	Mārga	...	...	1
1.3	Kriya	...	...	2
1.4	Aṅga	...	...	3
1.5	Graha	...	...	3
1.6	Jāti	...	...	3
1.7	Kaḷa	...	...	4
1.8	Laya	...	...	4
1.9	Yati	...	...	4
1.10	Prastāra	...	...	4

CHAPTER - 2 PRASTĀRA

2.1	Modes of prastāra	...	...	7
2.2	Divisions of prastāra	...	...	7
2.3	Rules for the process of prastāra	...	...	8
	2.3.1. Akhaṇḍa - prastāra	...	...	9
	2.3.1.1. Anulōma-prastāra	...	...	9
	2.3.1.2. Vilōma-prastāra	...	...	9
	2.3.2. Khaṇḍa - prastāra	...	...	10
2.4	Tables of Aṅgas and their application	...	...	10

CHAPTER - 3 APPLICATION OF PRASTĀRA

3.1	Pañcāṅga-prastāra	...	...	15
	3.1.1. Akhaṇḍa - prastāra	...	...	15
	3.1.1.1. Anulōma-prastāra	...	...	15
	3.1.1.2. Vilōma-prastāra	...	...	15
T.1.	Table of general permutations	...	...	16
	1. Saṅkhyā	...	...	16
	2. Mahāpātāḷa	...	...	16
3.1.2.	Khaṇḍa - prastāra	...	...	17
	3.1.2.1. Hīna-prastāra	...	...	17
	3.1.2.1.1. Anulōma-prastāra	...	...	17
	3.1.2.1.2. Vilōma-prastāra	...	...	18

3.1.2.2.	Yukta-prastāra	...	...	18
	3.1.2.2.1. Anulōma-prastāra	...	...	18
	3.1.2.2.2. Vilōma-prastāra	...	...	19
T.2.	Table of Druta (Druta-mēru)	...	...	20
T.3.	Table of Laghu (Laghu-mēru)	...	...	22
T.4.	Table of Guru (Guru-mēru)	...	...	23
T.5.	Table of Pluta (Pluta-mēru)	...	...	23
T.6.	Table of Kākapāda (Kākapāda-mēru)	...	...	24
T.7.	Table of Combinative-aṅgas (Saṁyōga-mēru)	...	...	24
3.2	Ṣaḍaṅga-prastāra	...	...	30
3.3	Saṁyuktāṅga-prastāra	...	...	31

CHAPTER-4
NAṢṬA, UDDIṢṬA & KALITA

4.1	Naṣṭa	...	...	34
4.2.	Uddiṣṭa	...	...	62
4.3	Kalita	...	...	73

CHAPTER-5
RELEVANT OLD SANSKRIT TEXTS FOLLOWED BY FREE ENGLISH TRANSLATION

5.1	Sanskrit text of Tālaprastāra from Saṅgīta Ratnākara written by Niḥaṅka Śārṅgadēva	...	...	86
5.1.1.	Free English translation	...	...	89
5.2	Sanskrit text of Tālaprastāra from Nartananirṇaya written by Paṇḍarīka Viṭṭhala	...	...	94
5.2.1.	Free English translation	...	...	95

CHAPTER - 6
TĀĻA PRASTĀRA-A CRITIQUE

6.1.	Details of treatises	...	...	98
6.2.	Modes of permutation	...	...	100
6.3.	Allocation of divisions of prastāra	...	...	101
6.4.	Rules of the process of prastāra	...	...	102
6.5.	The process of arriving at the figures of tables	...	...	102
6.6.	Pātāḷa and Mahāpātāḷa	...	...	102
6.7.	Akhaṇḍa-naṣṭa & Uddiṣṭa	...	...	104
6.8.	Akhaṇḍa-kalita	...	...	104
6.9.	Table of Druta (Druta-mēru)	...	...	105
6.10.	Table of Combinative-aṅgas (Saṁyōga-mēru)	...	...	105
6.11	Khaṇḍa-naṣṭa, Uddiṣṭa & Kalita	...	...	105
6.12.	Śōḍaśāṅgas - A critique	...	...	111

CHAPTER-7
TĀĻAS WITH SERIAL NUMBERS

	Tāḷas furnished with serial numbers	...	...	115
7.1	Tāḷas furnished in 'Saṅgīta Samayasāra'	...	...	116
7.2	Tāḷas furnished in 'Gāyakalōcanam'	...	...	118
	Glossary to the technical - terms	...	...	164

LIST OF TABLES, DIAGRAMS ETC.

	Page
1. Division of prastāra	6
2. Proxies of different modes of permutation	13
3. Proxies of different tables	14
4. Examples of Naṣṭa, Uddiṣṭa & Kalita	32
5. Kalita-8 DP-Brief version	74
6. Kalita-8 DP-Detailed version	75
7. Kalita-8 DP-Brief & detailed versions	76
8. Kalita-12 DP-DDP-Brief version	79
9. Kalita-12 DP-DDP-Detailed version	79
10. Kalita-12 DP-DDP-Brief & detailed versions	80
11. Kalita-8 DP-2 DCP-Brief version	83
12. Kalita-8 DP-2 DCP-Detailed version	83
13. Kalita-8 DP-2 DCP-Brief & detailed versions	84
14. Modified version of Caturaṅga-akhaṇḍa-prastāra	103
15. Modified version of Caturaṅga Druta-mēru	106
16. List of Combinative-aṅgas	107
17. Samudāyāṅga-mēru of Gāyakalōcanam	109
18. Modified version of Saṁyōga-mēru	110
19. Table of General - permutation - Trisra-jāti-Pañcāṅga- said to have been written by Śyāma Śāstry himself.	113
20. Serial numbers of 35 Tāḷas	114
21. Examples of different permutations	124
22. Tables of different permutations	139



CHAPTER - 1

TEN ELEMENTS OF TĀḶA

In South Indian Music the chapters of Rāga and TāḶa are very complex and elaborate. Between them, the system of TāḶa is more difficult and complicated. It is unparalleled in any system of music in the world. The various time measures used by all the nations of the world put together form only a small fraction of the innumerable varieties of rhythm used in South Indian Music.

The TāḶa is divided into ten elements and they are : 1.Kāla 2.Mārga 3.Kriya 4.Aṅga 5.Graha 6.Jāti 7.Kaḷa 8.Laya 9.Yati 10.Prastāra

1.1. KĀLA (काल)

This element is defined as the mode of measuring the duration of Kriya i.e., any act used to demonstrate or manifest the time quantity. It connotes the (uniform) speed with which the musical (or dance) event is executed over each division of the TāḶa cycle. Such speed i.e., the rate at which elements of a musical (or dance) event occur per unit time, is said to be first, second, third etc., depending on whether the event is executed at the initial, doubled or quadrupled rate i.e., whether the same event is executed in a given duration or in half or quarter of the original duration. Thus Kāla (musical speed) changes by progressive doubling.

The unit time for reckoning Kāla is Mātra. In order to accommodate elastic use and subjective variation, the Mātra is given in Śāstra a flexible definition.

1. The Mātra is taken as the total duration of uttering the five short syllables 'Ka, Ca, Ṭa, Ta and Pa'.

"Pañca-laghu- akṣarōccāra - mitā mātrēha kathyatē" - Śārṅgadēva's Saṅgīta Ratnākara, 5.16.

This value is adopted in Mārga TāḶas. Since Laghu (short) syllables are involved, the span is called Laghu. This also is approximately of the duration of a second.

2. It is equated to 'Nimēṣakāla' i.e., the time required to close and open the eyes naturally.

"Nimēṣakālō mātraḥ" - Kaḷānidhi (commentary of Kallinātha) on Śārṅgadēva's Saṅgīta Ratnākara, 5.15. (Gods are called 'Animiṣas' because they do not blink; others are 'Nimiṣas' because their eyes open and close).

This is taken roughly equal to a second and so Mātra roughly corresponds to the objective duration of a second.

3. In Dēśī TāḶas, however, the Laghu had a variable value; its Mātra could be of 4,5 or 6 units. This was finally standardised to a duration of a 4 units and is so used. This Laghu is hence called Caturaśra while the one of three units is called Trisra.

1.2. MĀRGA (मार्ग)

Mārga means extent or measure. It measures the magnitude of the organs of TāḶa such as Druta, Laghu etc. Its measuring device is Mātra or Kāla. It is not merely the total quantity of time but must include Kriya i.e., the act of performing TāḶa also. In other words Kāla, which is of the

form of a group of Kriyas is Mārga. The word Mārga is appropriate to this vital element because it indicates the root taken in time to arrive at the destination by manipulation of other elements.

Acyutarāya prescribed 8, 4, 2 & 1 Mātra-durations respectively for the Mārgas, Dakṣiṇa, Vārtika, Citra and Citratara. He further described the durations of Druta and Anudruta respectively for Citra-tama and Ati-citra-tama Mārgas.

1.3. KRIYA (क्रिय)

Kriya is the manual act used to demonstrate or manifest the quantity of each organ, the structure and the quantity of the Cycle (Āvarta) of a Tāḷa which are borne in the mind for their physical manifestation. Kriyas are separately described for Mārga and Dēśī Tāḷas. These are divided into sounded (Saśabda) and silent (Niḥśabda) Kriyas. Beat, finger snapping, clapping are examples of the former while counting, waving of the hand are examples of the latter.

I. Mārga-kriyas :

(a) Niḥśabda-kriyas :

1. Āvāpa : Counting of the time duration by folding the fingers of the hand facing upwards.
2. Niṣkrāma : Counting of the time duration by unfolding the fingers of the hand facing down-wards.
3. Vikṣēpa : Moving the hand towards right.
4. Praveśa : Bringing it back.

(b) Saśabda-kriyas :

1. Dhruva : Producing sound with the thumb and the middle-finger.
2. Śamyā : Striking on the right-hand palm with the left-hand palm.
3. Tāḷa : Striking on the left-hand palm with the right-hand palm.
4. Sannipāta : Clapping with both the hands facing each other.

II. Dēśya-kriyas :

(a) Niḥśabda-kriyas :

1. Sarpiṇi : Moving the hand towards left like a flag with the palm facing downwards.
2. Kṛṣṇa : Moving it towards right.
3. Padmini : Bringing it downwards towards the front side.
4. Visarjita : Waving it outwards turning the palm upwards.
5. Vikṣipta : Bringing it towards self closing-in the fingers.
6. Patāka : Raising the hand upwards like a flag.
7. Patita : Bringing it down like a flag.

(b) Saśabda-kriya :

1. Dhruvaka : A beat of the hand.

1.4. AṅGA (अंग)

Aṅga means organ. This element describes the structure of the Tāḷa in terms of the various divisions each of which is marked by an account of beat. The Aṅga of Tāḷa also means the number and order of its structural units. These are Anudruta containing single-unit duration, Druta having double-unit duration; and while Laghu carries varying duration basing upon the unit-values of Jāti, other remaining Guru, Pluta and Kākapāda carry 2, 3 & 4 times of the duration of Laghu respectively.

1. Anudruta : "U" is the sign of Anudruta. This should be rendered with the help of Dēśya-kriya, Dhruvaka and its synonyms are Ardhaçandra, Vyañjana, Anunāsika, Avyakta and Virāma.
2. Druta : "O" is the sign of Druta. This should be rendered with the help of Dhruvaka and Visarjita of Dēśya-kriyas and its synonyms are Ardhamātra, Vyōma, Bindu, Valaya, Vṛtta and Kham.
3. Laghu : "I" is the sign of Laghu. This should be rendered with the help of Dhruvaka followed by counting fingers for maintaining the different units of time of Jāti and its synonyms are Mātra, Saraḷa, Hrasva, Kaḷa and Śara.
4. Guru : "S" is the sign of Guru. This should be rendered with the help of Dhruvaka and Patita each followed by counting fingers for maintaining the units of time of Jāti and its synonyms are Dvimātra, Vakra, Kāṇa, Yamaḷa and Dīrgha.
5. Pluta : "Ś" is the sign of Pluta. This should be rendered with the help of Dhruvaka, Sarpiṇi and Kṛṣṇa each followed by counting fingers for maintaining the units of time of Jāti and its synonyms are Samōdbhava, Dīpta, Tryaṅga and Trimātra.
6. Kākapāda : "+" is the sign for Kākapāda. This should be rendered with the help of Sarpiṇi, Kṛṣṇa, Patāka and Patita, it being an absolute Niḥśabda-aṅga, each followed by counting fingers for maintaining the units of time of Jāti and its synonyms are Hamsapāda, Niḥśabda, Caturlaghu and Caturmātra.

1.5. GRAHA (ग्रह)

Graha is the position of attack i.e., mutual relation between the commencement of the Tāḷa cycle and the commencement of the melody line. This is of two kinds. It is said to be Sama if both positions of commencement coincide i.e., if the melody line commences at the commencement of the Tāḷa cycle itself. It is said to be Viśama otherwise. This is again of two kinds. It is Anāgata if the melody line commences after the Tāḷa cycle has commenced. It is Atīta if the melody line commences first.

1.6. JĀTI (जाति)

Jāti defines the quantity of the Tāḷa cycle by defining the quantity of Laghu. There are five Laghu-jātis. They are : Trisra, Caturaśra, Khaṇḍa, Miśra and Saṅkirṇa and have the time quantities of 3, 4, 5, 7 & 9 units respectively. Rarely other Laghu-jātis such as Divya-saṅkirṇa, Miśra-

saṅkīrṇa, Dēśya-saṅkīrṇa, Miśra-dēśya-saṅkīrṇa and Dēśya-śuddha-saṅkīrṇa containing 6, 8, 10, 12 & 16 units respectively are also used. Synonyms of all these ten Jātis are Svarga-laghu (3), Manuṣya-laghu (4), Dēśya-laghu (5), Hamsa-laghu (7), Citra-laghu (9), Divya-laghu (6), Simha-laghu (8), Varṇa-laghu (10), Vādyā-laghu (12), and Karnāṭaka-laghu (16) respectively. The different units of Laghu-jātis should be maintained by counting fingers of the same hand followed by the starting Kriya.

1.7. KALA (कळ)

Kaḷa defines the quantity of time possesses by the entire cycle or Āvarta of a Tāḷa. While the original quantity of such time is called. "Yathākṣara" or "Ēka-kaḷa", twice of its quantity is called "Dvikaḷa" and twice of the quantity of "Dvi-kaḷa" is called "Catuṣkaḷa". Dvi-kaḷa and Catuṣkaḷa are made use in Mārga-tāḷas in terms of Gurus only.

1.8. LAYA (लय)

Laya may be roughly translated as tempo which describes the speed of the melody line. It is of 3 kinds : Druta, Madhya and Vilambita i.e., fast, medium and slow respectively. Sometimes these tempi themselves are further sub-divided into the following 9 varieties, the names of which are self-descriptive :

Vilambita -vilambita,	Madhya -vilambita,	Druta -vilambita
-do- -madhya	-do- -madhya	-do- -madhya
-do- -druta	-do- -druta	-do- -druta

1.9. YATI (यति)

Yati is roughly translated into English as 'Caesura'. It consists of forming different patterns in melodic or word flow by arranging the pauses in various ways. This was done in two methods : (i) manipulating the slow, middle and fast tempi in such a way as to arrive at the desired pattern and (ii) arranging the Tāḷa organs of different sizes (heavy, light etc.) in such a way as to obtain the required pattern. They are different approaches to the same aspect.

Early treatises describe three Yatis : Sama, Śrōtōvaha and Gōpuccha. In Sama-yati the density of flow is uniform in word or melody. In Śrōtōvaha-yati it commences small but gradually enlarges like a river. Gōpuccha (lit.cow's tail) is the opposite i.e., flow begins large but tapers off at the end. Later treatises add three more : Mṛdaṅga-yati having heavy Aṅgas at the middle and lighter Aṅgas at the ends. This is also called 'Yavamadhya'. The opposite of this is called 'Pipīlika or Vēdamadhya'. If two tempi frequently recur in a repeating Tāḷa-cycle, it is said to be Kharjūrika-yati. In Viṣama-yati there is no discernible pattern in the arrangement of tempi or organs.

1.10. PRASTĀRA (प्रस्तार)

Rhythmical forms are innumerable and they all are the derivatives of this element, Prastāra, in which Tāḷaṅgas are permuted into all possible combinations in a systematic process to avoid repetition.

Taking the number of different Tāḷaṅgas used in the process of permutation into account the modes of permutation are divided into four kinds and they are : 1.Caturaṅga-prastāra 2.Pañcāṅga-

prastāra 3. Śaḍaṅga-prastāra and 4. Saṅhyuktāṅga-prastāra. Each one of these modes of permutation has two main divisions namely 1. Akhaṇḍa-prastāra and 2. Khaṇḍa-prastāra among which Khaṇḍa-prastāra has two sub-divisions namely 1. Hīna-prastāra and 2. Yukta-prastāra. All these divisions consist of two different processes of prastāra namely 1. Anulōma-prastāra and 2. Vilōma-prastāra and two key-figures namely 1. Saṅkhya and 2. Mahāpātāḷa, which are the total number of prastāras and the total number of Tāḷāṅgas used in the process of permutation respectively.

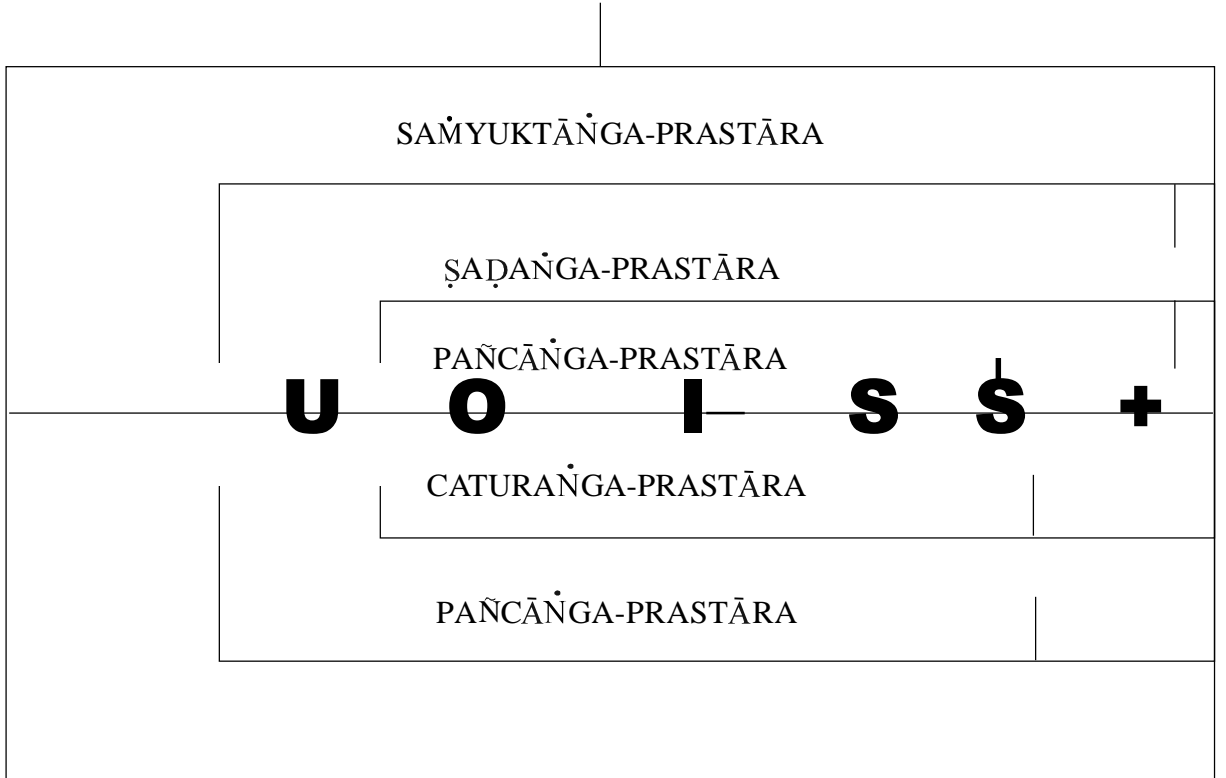
Even without adopting the laborious process of permutation there are very interesting easy methods to obtain the above two key-figures of Saṅkhya and Mahāpātāḷa and also to obtain the 'series of Tāḷāṅgas of a particular serial number of prastāra in question', the 'serial number of a prastāra in question containing a particular series of Tāḷāṅgas' and the 'total number of all the different Tāḷāṅgas used upto a particular serial number of prastāra in question' which are named as 'Naṣṭa, Uddiṣṭa and Kalita' respectively.

This element helps in obtaining the full details of all the various prastāras many of which are highly useful also in Swara-improvisation.



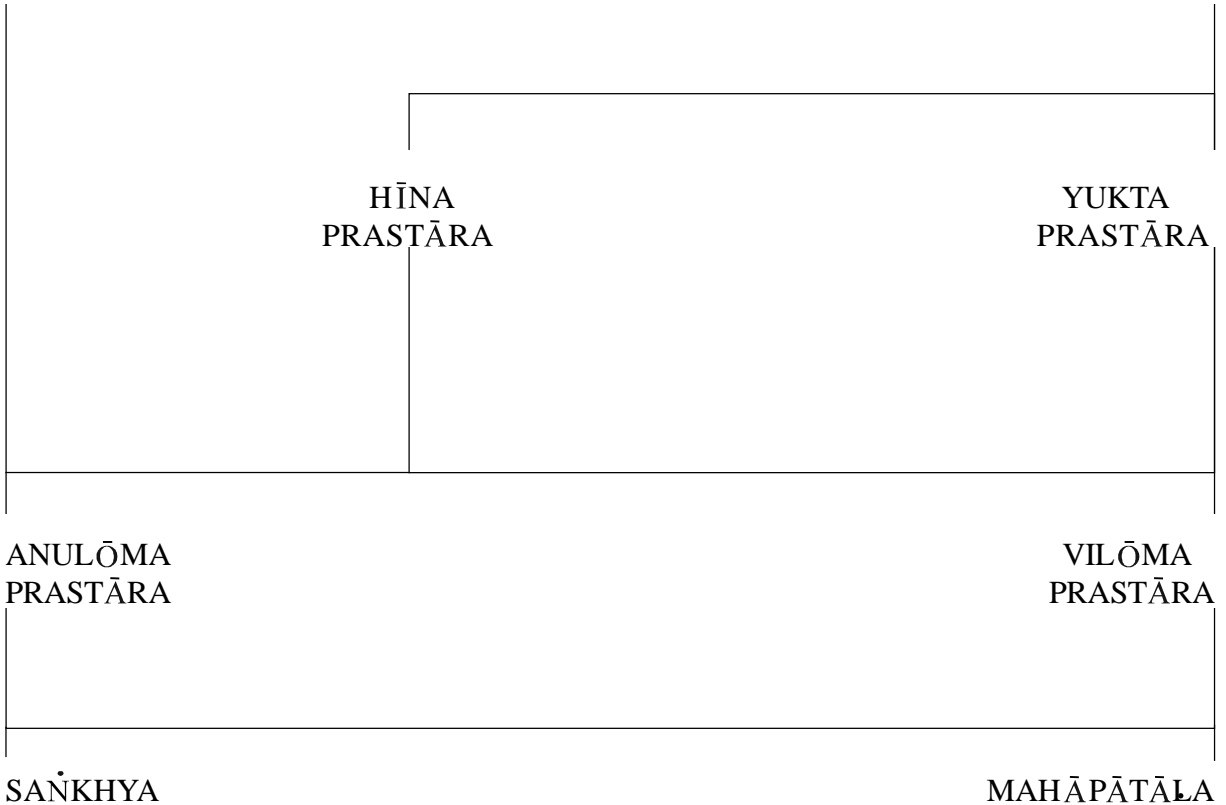
1. DIVISIONS OF PRASTĀRA

PRASTĀRA



AKHAṆḌA-PRASTĀRA

KHAṆḌA-PRASTĀRA



Chapter - 2

PRASTĀRA

Prastāra, the tenth element of rhythm, is more exhaustive and complicated than the remaining nine elements. Prastāra means permuting the Tāḷāṅgas or figures into all possible combinations and each and every conceivable rhythmical form is derived from this element. Thus, this becomes the encyclopaedic element of rhythm.

2.1. MODES OF PRASTĀRA

Depending upon the number of Aṅgas used in the process of permutation, the modes of prastāra are divided into four kinds.

1. Caturaṅga-prastāra : In this process of permutation four Aṅgas, Druta, Laghu, Guru and Pluta are used. This kind of permutation is prescribed for permuting the Aṅgas pertaining to Caturaśra-jāti only, it being the even number. Caturaṅga-prastāra is mentioned in the ancient books like Saṅgīta Ratnākara and Saṅgīta Darpaṇa.
2. Pañcāṅga-prastāra : (a) In this process of permutation five Aṅgas namely, Anudruta, Druta, Laghu, Guru and Pluta are used. This kind of permutation is prescribed for permuting the Aṅgas pertaining to all the Jātis containing odd numbers i.e., Trisra, Khaṇḍa, Miśra and Saṅkīrṇa. In addition to the above mentioned Caturaṅga-prastāra, this Pañcāṅga-prastāra is also mentioned in books like Tāḷadaśaprāṇapradīpika.

Note : The above two modes of Caturaṅga and Pañcāṅga-prastāras are devoid of Kākapāda (sound -less Aṅga) and the below mentioned three modes of Pañcāṅga-prastāra, (b) Ṣaḍaṅga-prastāra and Saṁyuktāṅga-prastāra are containing of Kākapāda. The figures of all the tables of this book are calculated for these three modes of permutation given below and if the figures of the above two modes are also desired the figures pertaining to Kākapāda of them should be excluded.

(b) In this process of permutation five Aṅgas namely Druta, Laghu, Guru, Pluta and Kākapāda are to be used and this kind of permutation is prescribed for permuting the Aṅgas pertaining to Caturaśra-jāti only. This is only an addition of Kākapāda to the above mentioned Caturaṅga-prastāra.

3. Ṣaḍaṅga-prastāra : In this process of permutation all the six Aṅgas namely Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda are to be used. This process could be applied for permuting the Aṅgas of all the Jātis consisting of the even and odd numbers alike. This too is an addition of Kākapāda to the above mentioned Pañcāṅga-prastāra (a) having been extended to Caturaśra-jāti also.
4. Saṁyuktāṅga-prastāra : In this process of permutation, in addition to the usual six Aṅgas i.e., Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda, various other combinations of two or more of these six Aṅgas, formed by interlacing and writing one above the other, are also used. The synonyms of this mode of permutation are 'Miśramāṅga-prastāra and Miśritāṅga-prastāra'.

2.2. DIVISIONS OF PRASTĀRA

This element, prastāra has two main divisions and they are : 1. Akhaṇḍa-prastāra (synonyms: Nija-prastāra and Sarva-prastāra) in which Aṅgas should be permuted following some stipulated

rules and regulations and 2. Khaṇḍa-prastāra in which Aṅgas should be permuted following the same rules as in Akhaṇḍa-prastāra but observing some restrictions like devoid of a particular Aṅga. Among them Khaṇḍa-prastāra has two sub-divisions and they are : 1. Hīna-prastāra in which permutation should be made devoid of a particular Aṅga and 2. Yukta-prastāra in which permutation should be made containing of a particular number of a particular Aṅga. The process of permutation of all the above divisions is of two kinds and they are 1. Anulōma-prastāra in which the process of permutation should be made in obverse order and 2. Vilōma-prastāra in which the process of permutation should be made in reverse order.

Under all the above divisions various and innumerable prastāras derive upon mathematical basis and to precisely know the details of all those prastāras two key-figures namely Saṅkhya and Mahāpātāḷa are prescribed which represent the total number of the prastāras and the total number of all the different Aṅgas used in the process of permutation respectively.

There are very interesting easy methods to obtain the above two key-figures of Saṅkhya and Mahāpātāḷa even without adopting the laborious process of permutation. Also there are three more very important and useful easy methods named as Naṣṭa, Uddiṣṭa and Kalita by which answers for 'the series of Aṅgas of a particular number of prastāra in question', 'the serial number of a prastāra containing a particular series of Aṅgas in question' and 'the total number of all the different Aṅgas used in the process of permutation upto a particular number of prastāra in question' could respectively be obtained very easily even without adopting the laborious process of permutation.

Among them while Naṣṭa and Uddiṣṭa could be answered with the help of Saṅkhya, Kalita could be answered with the help of both Saṅkhya and Mahāpātāḷa.

2.3. RULES FOR THE PROCESS OF PRASTĀRA

In order to easily understand and follow the process of permutation let us recollect the unit's column, tenth's column etc., as is taught in general mathematics. These columns are counted and read from the right towards left. For example, in the number 987654321, the figure:

- '1' is in the units' column,
- '2' is in the tenths' column,
- '3' is in the hundreds' column,
- '4' is in the thousands' column,
- '5' is in the ten-thousands' column,
- '6' is in the lakhs' column,
- '7' is in the ten-lakhs' column,
- '8' is in the crores' column,
- '9' is in the ten-crores' column,

Note : For the purpose of permutation the Aṅgas should always be cited and written only from right towards the left observing the above columns.

Some rules and regulations are to be followed to write all the possible permutations and combinations serially to avoid iteration and they are prescribed hereunder :

2.3.1. AKHAṆḌA-PRASTĀRA

(General-permutation)

2.3.1.1. Anulōma-prastāra (obverse-permutation) :

1. The value of any prastāra should be cited in number of the least (inferior) Aṅgas only occurring in a particular mode of permutation and for the value of such prastāra, minimum possible number of Aṅgas only should be written in the 1st prastāra, carefully observing the relevant rules and restrictions, if any. If two or more Aṅgas are to be written in the 1st prastāra they should be written anti-clockwise only in descending order of value from right to left of the 1st prastāra.
2. If there is more than one Aṅga in the prastāra, the permutable Aṅga at the extreme left should at first be permuted.
3. If the Aṅgas in the extreme left are so minute that they cannot further be permuted, the immediate next permutable Aṅga to their right only should be permuted.
4. To permute an Aṅga write down the immediate lower Aṅga in value than of the upper Aṅga in the same column.
5. After writing down the lower Aṅga than of the upper Aṅga, for the remainder, a suitable independent Aṅga should be written to the left of the Aṅga already written. For this remainder, if two or more Aṅgas are to be written they should be written anti-clockwise only in descending order of value to the left of the Aṅga already written.
6. If there are Aṅgas to the left of the upper Aṅga the remainder-value of the permuted Aṅga should be added to the total value of all the left-side Aṅgas and a suitable Aṅga should be written to the left of the Aṅga already written and if two or more Aṅgas are to be written for this total value they should be written anti-clockwise to the left of the Aṅga already written in descending order of value.
7. The Aṅgas, if any, which are at the right of the Aṅga being permuted, should be brought down and written as they are in the same columns.
8. Carefully observing the relevant rules and restrictions, if any, the process of permutation should be continued until all the Aṅgas become so minute that none of them could further be permuted.
9. Among all the prastāras the total value of all the Aṅgas of each prastāra should always be one and the same.

2.3.1.2. Vilōma-prastāra (reverse-permutation) :

Note : In Vilōma-prastāra the process of permutation of Aṅgas should be made just in the reverse order of Anulōma-prastāra mentioned above and this could easily be understood by writing the Anulōma-prastāras in reverse order successively one below the other from the last one to the first one.

1. In the 1st prastāra all the Aṅgas of inferior value should only be written to the value of the prastāra and in this process if different Aṅgas are to be written they should always be written

anti-clockwise i.e., from right to left, in ascending order of value carefully observing the restrictions, if any.

2. From left to right the second of the Aṅgas should only be permuted in reverse order into possible superior Aṅgas.
3. To permute an Aṅga in reverse order the immediate superior Aṅga should always be written below the inferior Aṅga i.e., Druta below Anudruta, Laghu below Druta, figure '2' below '1', figure '3' below '2' and so on following the restrictions, if any.
4. If the value of the superior Aṅga to be written exceeds the value of its upper Aṅga, including the total value of its preceding Aṅgas, without permuting this upper Aṅga, the next Aṅga of its right should only be permuted.
5. After writing the superior Aṅga below the inferior Aṅga if the total value of the above inferior Aṅga, including its preceding Aṅgas, exceeds the value of the superior Aṅga one or more least (inferior) Aṅgas should be written for the difference of value anti-clockwise to the left of the superior Aṅga, carefully observing the restrictions, if any.
6. All the Aṅgas which are at the right side of the inferior Aṅga being permuted in reverse order should always be brought down and written as they are in their respective columns.
7. This process of permutation in reverse order should always be continued until all the Aṅgas of the prastāra become possible superior ones.
8. Among all the prastāras the total value of all the Aṅgas of each prastāra should always be one and the same.

2.3.2. KHAṆḌA-PRASTĀRA

(Divisional-permutation)

The process of Khaṇḍa-prastāra should also be made following the same rules of Akhaṇḍa-prastāra mentioned above but observing some restrictions like devoid or containing a particular Aṅga. This is of two kinds and they are namely 1. Hīna-prastāra (Devoid-permutation) in which the process of permutation should be made devoid of a particular Aṅga and 2. Yukta-prastāra (Containing-permutation) in which the process of permutation should be made containing a particular number of a particular Aṅga as furnished in the examples.

2.4. TABLES OF AṅGAS AND THEIR APPLICATION

The details of the two key-figures, Saṅkhyā and Mahāpātāḷa of all modes of permutation are furnished in this book in the 'Tables of different permutations' at the end of this book. Among them the tables from :

- | | | | | | | |
|-----|------|----|------|-----------|-------------------|------------------|
| (a) | 1st | to | 7th | belong to | Pañcāṅga-prastāra | (Caturaśra-jāti) |
| (b) | 8th | to | 15th | belong to | Ṣaḍaṅga-prastāra | (Trisra-jāti) |
| (c) | 16th | to | 22nd | belong to | Ṣaḍaṅga-prastāra | (Caturaśra-jāti) |
| (d) | 23rd | to | 28th | belong to | Ṣaḍaṅga-prastāra | (Khaṇḍa-jāti) |

- (e) 29th to 33rd belong to Ṣaḍaṅga-prastāra (Miśra-jāti)
 (f) 34th to 38th belong to Ṣaḍaṅga-prastāra (Saṅkirṇa-jāti)
 (g) 39th to 52nd belong to Saṁyuktāṅga-prastāra (all Jātis)

In each group of tables, except for Saṁyōga-mēru, for the remaining tables of general-permutation and for all the horizontal-lowest-lines of the tables of independent Aṅgas, write the number of houses upto the required permutation in terms of the number of the least Aṅgas and for all the upper-lines, gradually reducing the number of houses corresponding with their respective proxies for each upper-line, from the left extreme. For example, for 12 DP, the horizontal-lowest-lines of all the tables should consist of 12 houses and for the tables of Druta, Laghu, Guru, Pluta and Kākapāda the number of houses of each upper-line, should gradually reduce equal with the number of their respective proxies i.e., 1, 2, 4, 6 & 8 from the left extreme.

In each page of these tables the serial numbers given in thick bold type at the top of the vertical lines denote the unit-value of each respective permutation in number of the respective least (inferior) Aṅga (Drutas in respect of Pañcāṅga-prastāra, Anudruta in respect of Ṣaḍaṅga-prastāra and the general units in respect of Saṁyuktāṅga-prastāra). The respective figures of Saṅkhyā and Mahāpātāḷa are given below in the respective houses in bold and small types of figures respectively. In each group of tables while the first table furnishes the particulars of Akhaṇḍa-prastāra, all the other remaining tables furnish the particulars of Khaṇḍa-prastāra.

In each group of tables in the first 'Table of General permutations' the figures in the top horizontal line are the respective figures of Saṅkhyā and Mahāpātāḷa shown in bold and small types of figures respectively and in the subsequent lower houses the numbers of the Aṅgas containing are furnished in detail of which the grand total of each vertical line forms the figure of the respective Mahāpātāḷa. For example in the first table of Pañcāṅga-prastāra the vertical line having the bold figure '8' in the top indicates the 8-Drutas-permutation (8-DP) in which Kākapāda stands in the first permutation and in which there are 61 permutations (Saṅkhyā) in total containing of 299 Aṅgas (Mahāpātāḷa) and as per the figures of the subsequent lower lines there are :

180	Drutas	(total of the 1st proxies	- 33	+ 147	= 180)
91	Laghus	(total of the 2nd proxies	- 19	+ 72	= 91)
22	Gurus	(total of the 4th proxies	- 6	+ 16	= 22)
5	Plutas	(total of the 6th proxies	- 2	+ 3	= 5)
1	Kākapāda	(total of the 8th proxies	- 1	+ -	= 1)

--- striking the grand-total of 299 Aṅgas of Mahāpātāḷa.

In each group of tables, in the last table which is called Saṁyōga-mēru or Table of combinative Aṅgas, the figures of each horizontal line are the total numbers of permutations (Saṅkhyā) consisting the Aṅga or combinations of Aṅgas written at the top of the vertical line. For example, in the 7th table of Pañcāṅga-prastāra from left towards right as per the general vertical line having the thick bold figure '8' which denotes the 8-Druta-permutation there are bold type figures, 1, 1, 32, 1, 5, 3, 0, 12, 3, 2 & 1 which are the total numbers of permutations (Saṅkhyā) pertaining to Druta, Laghu, Druta-Laghu, Guru, Druta-Guru, Laghu-Guru, Pluta, Druta-Laghu-Guru, Druta-pluta, Laghu-pluta and Kākapāda respectively as per the Aṅga or combination of Aṅgas written at the top of the respective vertical line and the small type of figures, 8, 4, 189, 2,

25, 9, 0, 48, 9, 4 & 1 indicate the total numbers of the Aṅgas (Mahāpātāḷa) containing of the above permutations respectively.

Apart from the first and last tables of each group of tables each other table furnishes the details of a particular Aṅga. In these tables while each vertical line, usually, belongs to a certain unit-value of permutation as per the thick bold type of figures written at the top, bold and small types of figures of each horizontal line furnish the details of Saṅkhyā and Mahāpātāḷa respectively consisting a particular number of a particular Aṅga as per the bold type of figure written at the extreme right. For example, as per the 2nd 'Table of Druta' of Pañcāṅga-prastāra the vertical line, wherein the thick bold type of figure '8' is written at the top, pertains to 8-Drutas-permutation and from bottom to top the bold type of figures 8, 0, 25, 0, 20, 7, 0 & 1 and the respective small type of figures, 20, 0, 107, 0, 115, 0, 49, 0 & 8 are the figures of Saṅkhyā and Mahāpātāḷa respectively pertaining to the permutations Devoid-of-druta, containing 1-Druta, 2-Drutas, 3-Drutas, 4-Drutas, 5-Drutas, 6-Drutas, 7-Drutas and 8-Drutas as per the figures 0, 1, 2, 3, 4, 5, 6, 7 & 8 indicated in the extreme right of each horizontal line respectively from bottom to top of the table.

In the same manner the figures of all the tables should be applied and understood.



2. THE FIRST ANGAS OF DIFFERENT MODES OF PERMUTATION

Units	Pañcāṅga	Ṣaḍaṅga					Sāmyuktāṅga					Units
	2	3	4	5	7	9	3	4	5	7	9	
1	O	U	U	U	U	U	U	U	U	U	U	1
2	I	O	O	O	O	O	O	O	O	O	O	2
3	OI	I	UO	UO	UO	UO	I	⊖	⊖	⊖	⊖	3
4	S	UI	I	OO	OO	OO	⊕	I	⊗	⊗	⊗	4
5	OS	OI	UI	I	UOO	UOO	⊙	⊕	I	⊗	⊗	5
6	Ṣ	S	OI	UI	OOO	OOO	S	⊙	⊕	⊗	⊗	6
7	Ṣ	US	UOI	OIL	I	UOOO	Ṣ	⊙	⊙	I	⊗	7
8	+	OS	S	UOI	UI	OOOO	Ṣ	S	⊙	⊕	⊗	8
9	O+	Ṣ	US	OOI	OI	I	Ṣ	Ṣ	⊙	⊙	I	9
10	I+	UṢ	OS	S	UOI	UI	Ṣ	Ṣ	S	⊙	⊕	10
11	OI+	OṢ	UOS	US	OOI	OI	Ṣ	Ṣ	Ṣ	⊙	⊙	11
12	S+	+	Ṣ	OS	UOOI	UOI	+	Ṣ	Ṣ	⊙	⊙	12

3. PROXIES OF DIFFERENT TABLES

Prastāra Akhaṇḍa - prastāra Sl.No.of - Line the table	Pañcāṅga - Caturaśra								Ṣaḍaṅga - Trisra						Ṣaḍaṅga - Caturaśra						Ṣaḍaṅga - Khaṇḍa						Ṣaḍaṅga- Miśra						Ṣaḍaṅga- Saṅkīrṇa						Saṅhyukt ṅga- All jātis											
	1 2 4 6 8				1 2 3 6 9 12				1 2 4 8 12 16				1 2 5 10 15 20				1 2 7 14 21 28				1 2 9 18 27 36				1 2 3 4 5 6																									
	TL	SL			TL	SL			TL	SL			TL	SL			TL	SL			TL	SL			TL	SL																								
1 - BL -	-	-	2	4	6	8	-	-	2	3	6	9	12	-	-	2	4	8	12	16	-	-	2	5	10	15	20	-	-	2	7	14	21	28	-	-	2	9	18	27	36	-	-	2	3	4	5	6		
UL -	1	-	2	4	6	8	1	-	2	3	6	9	12	1	-	2	4	8	12	16	1	-	2	5	10	15	20	1	-	2	7	14	21	28	1	-	2	9	18	27	36	1	-	2	3	4	5	6		
2 - BL -	-	1	-	4	6	8	-	1	-	3	6	9	12	-	1	-	4	8	12	16	-	1	-	5	10	15	20	-	1	-	7	14	21	28	-	1	-	9	18	27	36	-	1	-	3	4	5	6		
UL -	2	1	-	4	6	8	2	1	-	3	6	9	12	2	1	-	4	8	12	16	2	1	-	5	10	15	20	2	1	-	7	14	21	28	2	1	-	9	18	27	36	2	1	-	3	4	5	6		
3 - BL -	-	1	2	-	6	8	-	1	2	-	6	9	12	-	1	2	-	8	12	16	-	1	2	-	10	15	20	-	1	2	-	14	21	28	-	1	2	-	18	27	36	-	1	2	-	4	5	6		
UL -	4	1	2	-	6	8	3	1	2	-	6	9	12	4	1	2	-	8	12	16	5	1	2	-	10	15	20	7	1	2	-	14	21	28	9	1	2	-	18	27	36	3	1	2	-	4	5	6		
4 - BL -	-	1	2	4	-	8	-	1	2	3	-	9	12	-	1	2	4	-	12	16	-	1	2	5	-	15	20	-	1	2	7	-	21	28	-	1	2	9	-	27	36	-	1	2	3	-	5	6		
UL -	6	1	2	4	-	8	6	1	2	3	-	9	12	8	1	2	4	-	12	16	10	1	2	5	-	15	20	14	1	2	7	-	21	28	18	1	2	9	-	27	36	4	1	2	3	-	5	6		
5 - BL -	-	1	2	4	6	-	-	1	2	3	6	-	12	-	1	2	4	8	-	16	-	1	2	5	10	-	20	-	1	2	7	14	-	28	-	1	2	9	18	-	36	-	1	2	3	4	-	6		
UL -	8	1	2	4	6	-	9	1	2	3	6	-	12	12	1	2	4	8	-	16	15	1	2	5	10	-	20	21	1	2	7	14	-	28	27	1	2	9	18	-	36	5	1	2	3	4	-	6		
6 - BL -								-	1	2	3	6	9	-	-	1	2	4	8	12	-	-	1	2	5	10	15	-	-	1	2	7	14	21	-	-	1	2	9	18	27	-	-	1	2	3	4	5	-	
UL -								12	1	2	3	6	9	-	16	1	2	4	8	12	-	20	1	2	5	10	15	-	28	1	2	7	14	21	-	36	1	2	9	18	27	-	6	1	2	3	4	5	-	

Chapter - 3

APPLICATION OF PRASTĀRA

3.1. PAÑCĀṄGA-PRASTĀRA

In this mode of Pañcāṅga-prastāra five Aṅgas, Druta, Laghu, Guru, Pluta and Kākapāda should be used in the process of permutation and this is prescribed for permuting the Aṅgas of Caturaśra-jāti only.

3.1.1. AKHAṆḌA-PRASTĀRA

3.1.1.1. Anulōma-prastāra : Example : 4-DP (4-Drutas-permutation)

- 1st prastāra : As per rule No.1 write Guru in the units' column (S).
- 2nd prastāra : As per rule No.4, just below the Guru of the units' column write one Laghu and as per rule No.5 write another Laghu in the tens' column (II).
- 3rd prastāra : Write one Druta in the tens' column as per rules Nos.2 & 4, write another Druta in the hundreds' column as per rule No.5 and one Laghu in the units' column as per rule No.7.(00I).
- 4th prastāra : Write one Druta in the units' column as per rules Nos. 3 & 4, one Laghu in the tens' column and one Druta in the hundreds' column as per rule No.6 (0I0).
- 5th prastāra : Write one Druta in the tens' column as per rules Nos. 3 & 4, one Laghu in the hundreds' column as per rule No.6 and one Druta in units' column as per rule No.7 (100).
- 6th prastāra : Write one Druta in the hundreds' column as per rule No.4, another Druta in the thousands' column as per rule No.5 and one Druta each in tens' and units' columns as per rule No.7 (0000).

By now as per rule No.8 the process of permutation of 4-DP is over resulting in six kinds of prastāras, in total. In all these varieties the total value of Aṅgas is '8' as per rule No.9. Among these six prastāras, the 1st prastāra is Gurvanta-prastāra, 2nd and 3rd are Laghvanta-prastāras, 4th, 5th and 6th prastāras are Drutānta-prastāras and the last one is called 'Sarva-drutānta-prastāra (All-durta-ending-permutation-ADEP)'.

3.1.1.2. Vilōma-prastāra : Example : 4-DP

- 1st prastāra : As per rule No.1 write four Drutas in the thousands', hundreds', tens' and units' columns respectively (0000).
- 2nd prastāra : As per rules Nos.2, 3 & 4 write Laghu in the hundreds' column and as per rule No.6 write Druta in each of the units' and tens' columns (I00).
- 3rd prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the tens' column, write Druta in the hundreds' column as per rule No.5 and write another Druta in the units' column as per rule No.6 (0I0).
- 4th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the units' column and write Druta each in tens' and hundreds' columns as per rule No.5 (00I).

5th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the tens' column and write another Laghu in the units' column as per rule No.6 (II).

6th prastāra : As per rules Nos.2, 3 & 4 write Guru in the units' column (S).

As per rule No.7 this Guru is the only possible superior Aṅga of 4-DP and as per rule No.8 all these six permutations carry the same value of 4-DP.

In the same manner the process of all modes of permutation should be followed. More examples are furnished at the end of this book.

T.1. TABLE OF GENERAL - PERMUTATIONS

	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	6	10	19	33	61	108	196	350	632
	1	3	7	16	34	72	147	299	596	1182	2316	4517

Key-rules :

1. Saṅkhyā : The total of all the existing 1st, 2nd, 4th, 6th and 8th proxies which represent the Drutānta-prastāras, Laghvanta-prastāras, Gurvanta-prastāras, Plutānta-prastāras and Kākapādānta-prastāras respectively, should be written (refer table-1).

Example : At the first instance write the figure '1' to the left of the extreme left house as per the general key-rule mentioned in the 'Important technical-terms, abbreviations & signs'.

No. of the house	1st Proxy	2nd Proxy	4th Proxy	6th Proxy	8th Proxy	Total
1	1	-	-	-	-	1
2	1	1	-	-	-	2
3	2	1	-	-	-	3
4	3	2	1	-	-	6
5	6	3	1	-	-	10
6	10	6	2	1	-	19
7	19	10	3	1	-	33
8	33	19	6	2	1	61
9	61	33	10	3	1	108
10	108	61	19	6	2	196
11	196	108	33	10	3	350
12	350	196	61	19	6	632

In the above manner write the figures of 'Saṅkhyā' of all the tables pertaining to all the other modes of permutation using the respective proxies.

2. Mahāpātāḷa : The total of all the existing 1st, 2nd, 4th, 6th and 8th proxies of both 'Saṅkhyā and Mahāpātāḷa' should be written. While doing so, the figure '1' to the extreme left of Saṅkhyā, which is written as per the general key-rule, should also be taken into account even if its corresponding figure of 'Mahāpātāḷa' does not exist.

Example :

No. of the house	1st Proxy		2nd Proxy		4th Proxy		6th Proxy		8th Proxy		Total
	S	M	S	M	S	M	S	M	S	M	
1	1	-	-	-	-	-	-	-	-	-	1
2	1	1	1	-	-	-	-	-	-	-	3
3	2	3	1	1	-	-	-	-	-	-	7
4	3	7	2	3	1	-	-	-	-	-	16
5	6	16	3	7	1	1	-	-	-	-	34
6	10	34	6	16	2	3	1	-	-	-	72
7	19	72	10	34	3	7	1	1	-	-	147
8	33	147	19	72	6	16	2	3	1	-	299
9	61	299	33	147	10	34	3	7	1	1	596
10	108	596	61	299	19	72	6	16	2	3	1182
11	196	1182	108	596	33	147	10	34	3	7	2316
12	350	2316	196	1182	61	299	19	72	6	16	4517

In the above manner write the figures of 'Mahāpātāḷa' of all the tables pertaining to all the other modes of permutation using the respective proxies.

3.1.2. KHAṆḌA-PRASTĀRA

3.1.2.1. Hīna-prastāra :

3.1.2.1.1. Anulōma-prastāra : Example : Druta-devoid-permutation (DDP) of 8-DP.

Note :- Since this is exclusively the process of DDPs each and every permutation should be devoid of Druta.

- 1st prastāra : According to Akhaṇḍa-prastāra since the 1st prastāra is devoid of Druta write the same in the 1st prastāra (+).
- 2nd prastāra : According to Akhaṇḍa-prastāra since the 2nd prastāra is also devoid of Druta write the same in the 2nd prastāra (IŚ).
- 3rd prastāra : According to Akhaṇḍa-prastāra if the Laghu which is in the tens' column of 2nd prastāra is further permuted it results in two Drutas which is contrary to the main principle of arriving at any prastāra devoid of Druta. So, without permuting the Laghu which is in the tens' column, the Pluta which is in the units' column should only be permuted by writing one Guru in the units' column and another Guru in the tens' column as per rule No.6 (SS).
- 4th prastāra : According to Akhaṇḍa-prastāra as per rules Nos. 4 & 5 write one Laghu each in the tens' and hundreds' columns and write Guru in the units column as per rule No.7 (IIS).
- 5th prastāra : Further permuting the Laghus in the hundreds' and tens' columns of the 4th prastāra results in writing Drutas. So, the Guru in the units' column should only be permuted and thus

write one Laghu in the units' column as per rule No.4 and write one Pluta in the tens' column as per rule No.6 (ŚI).

6th prastāra : Write as in Akhaṇḍa-prastāra (ISI).

7th prastāra : Further permuting the Laghu in the hundreds' column of 6th prastāra results in writing Drutas. So, avoiding it, the Guru in the tens' column should only be permuted and thus write one Laghu in the tens' column as per rule No.4, write one Guru in the hundreds' column as per rule No.6 and write another Laghu in the units' column as per rule No.7 (SII).

8th prastāra : Write as in Akhaṇḍa-prastāra and no further permutation should be made as it results in contrary to the main principle of avoiding Drutas (III).

3.1.2.1.2. Vilōma - prastāra : Example : DDPs of 8-DP

1st prastāra : As per rule No.1 write Laghus in each of the units', tens', hundreds' and thousands' columns equal to the value of 8-DP (III).

2nd prastāra : As per rules Nos. 2, 3 & 4 write Guru in the hundreds' column and write one Laghu each in the units' and tens' columns as per rule No.6 (SII).

3rd prastāra : As per rules Nos. 2, 3 & 4 write Guru in the tens' column, write Laghu in the hundreds' column as per rule No.5 and write another Laghu in the units' column as per rule No.6 (ISI).

4th prastāra : As per rules Nos. 2, 3 & 4 write Pluta in the tens' column and write Laghu in the units' column as per rule No.6 (ŚI).

5th prastāra : As per rules Nos. 2, 3 & 4 write Guru in the units' column and write Laghu each in the tens' and hundreds' columns as per rule No.5 (IIS).

6th prastāra : As per rules Nos. 2, 3 & 4 write Guru in the tens' column and write another Guru in the units' column as per the rule No.6 (SS).

7th prastāra : As per rules Nos. 2, 3 & 4 write Pluta in the units' column and write Laghu in the tens' column as per rule No.5 (IŚ).

8th prastāra : As per rules Nos. 2, 3 & 4 write Kākapāda in the units' column (+).

As per rule No.7 this Kākapāda is the possible superior Aṅga of 8-DP and as per rule No.8 all these eight prastāras carry the same value of 8-DP.

3.1.2.2. Yukta-prastāra :

3.1.2.2.1. Anulōma-prastāra: Example: Two-druta-containing-permutations (2-DCPs) of 6-DP.

Note :- As this is the process of 2-DCPs each and every prastāra should invariably contain two Drutas.

1st prastāra : According to Akhaṇḍa-prastāra, if a Pluta is written at the first instance this prastāra becomes absolutely devoid of Druta which is contrary to the principle and so to make it 2-DCP write one Guru in the units' column and one Druta each in the tens' and hundreds' columns (OOS).

2nd prastāra : According to Akhaṇḍa-prastāra, as per rule No.4 the Guru in the units' column should be permuted and a Laghu should be written in the units' column but later, as per rule

No.6 since writing a Guru results in contrary to the principle, write one Laghu each in the units' and tens' columns and one Druta each in the hundreds' and thousands' columns (OOII).

3rd prastāra : Write as in Akhaṇḍa-prastāra (OIOI)

4th prastāra : Write as in Akhaṇḍa-prastāra (IOOI)

5th prastāra : Further permuting the Laghu in the thousands' column is contrary to the principle as it results in writing more number of Drutas, as per rules Nos. 4 & 6 the Laghu in the units' column should only be permuted and thus write Druta, Guru and Druta in the units', tens' and hundreds' columns respectively (OSO).

6th prastāra : Write as in Akhaṇḍa-prastāra (OIIO).

7th prastāra : Write as in Akhaṇḍa-prastāra (IOIO).

8th prastāra : Since it is contrary to the principle to permute the Laghu in the thousands' column as it results in writing more number of Drutas permute the Laghu which is in the tens' column only and write one Druta in the tens' column and one Guru in the hundreds' column as per rules Nos. 4 & 6 and write another Druta in the units' column as per rule No.7 (SOO).

9th prastāra : Write as in Akhaṇḍa-prastāra (IIOO).

This process of permutation should not be continued as it is contrary to the principle.

3.1.2.2.2. Vilōma-prastāra : Example : 2-DCPs of 6-DP.

1st prastāra: As per rule No.1 write Druta in each of the units' and tens' columns and write Laghu in each of the hundreds' and thousands' columns (IIOO).

2nd prastāra : As per rules Nos. 2, 3 & 4 write Guru in the hundreds' column and write Druta each in the units' and tens' columns as per rule No.6 (SOO).

3rd prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the tens' column, write Druta and Laghu in the hundreds' and thousands' columns respectively as per rule No.5 and write Druta in the units' column as per rule No.6 (IOIO).

4th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the hundreds' column, write Druta in the thousands' column as per rule No.5 and write Druta and Laghu in the units' and tens' columns respectively as per rule No.6 (OIIO).

5th prastāra : As per rules Nos. 2, 3 & 4 write Guru in the tens' column, write Druta in the hundreds' column as per rule No.5 and write another Druta in the units' column as per rule No.6 (OSO).

6th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the units' column and write Druta each in tens' and hundreds' columns and Laghu in the thousands' column as per rule No.5 (IOOI).

7th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the hundreds' column, write Druta in the thousands' column as per rule No.5 and write Laghu and Druta in the units' and tens' columns respectively as per rule No.6 (OIOI).

8th prastāra : As per rules Nos. 2, 3 & 4 write Laghu in the tens' column, write Druta each in the hundreds' and thousands' columns as per rule No.5 and write another Laghu in the units' column as per rule No.6 (OOII).

9th prastāra : To make it 2-DCP write Guru in units' column as per rules Nos. 2, 3 & 4 and write Druta each in the tens' and hundreds' columns as per rule No.5 (OOS).

As per rule No.7 this is the series containing the possible superior Aṅgas without violating the restriction of 2-DCP and as per rule No.8 all these nine permutations carry the same value of 6-DP.

The above method should be applied to all the other modes of permutation also.

T.2. TABLE OF DRUTA (DRUTA-MĒRU)

	1	2	3	4	5	6	7	8	9	10	11	12	
		1	0	3	0	9	0	25	0	66	0	165	2
		2	0	9	0	33	0	107	0	321	0	903	
	1	0	2	0	5	0	12	0	28	0	62	0	1
	1	0	4	0	13	0	38	0	104	0	268	0	
1	0	1	0	2	0	4	0	8	0	15	0	29	0
	0	1	0	3	0	8	0	20	0	47	0	107	

Key-rules :

Lowest-line :

- Saṅkhya :** The total of the existing respective proxies, except the 1st proxy, it being the table of the 1st Aṅga, should be written (refer table-2).

Note:- As per the general key-rule mentioned in the 'Important technical terms, abbreviations & signs' write figure '1' to the left of the extreme left house.

No. of the house	2nd Proxy	4th Proxy	6th Proxy	8th Proxy	Total
1	-	-	-	-	0
2	1	-	-	-	1
3	0	-	-	-	0
4	1	1	-	-	2
5	0	0	-	-	0
6	2	1	1	-	4
7	0	0	0	0	0
8	4	2	1	1	8
9	0	0	0	0	0
10	8	4	2	1	15
11	0	0	0	0	0
12	15	8	4	2	29

2. **Mahāpātāḷa** : The total of the respective proxies of both 'Sāṅkhya and Mahāpātāḷa', except the 1st proxies, they being the houses of 1st Aṅga, should be written.

No. of the house	2nd Proxy		4th Proxy		6th Proxy		8th Proxy		Total
	S	M	S	M	S	M	S	M	
1	-	-	-	-	-	-	-	-	0
2	1	-	-	-	-	-	-	-	1
3	0	0	-	-	-	-	-	-	0
4	1	1	1	-	-	-	-	-	3
5	0	0	0	0	-	-	-	-	0
6	2	3	1	1	1	-	-	-	8
7	0	0	0	0	0	0	-	-	0
8	4	8	2	3	1	1	1	-	20
9	0	0	0	0	0	0	0	0	0
10	8	20	4	8	2	3	1	1	47
11	0	0	0	0	0	0	0	0	0
12	15	47	8	20	4	8	2	3	107

Upper-lines :

1. **Sāṅkhya** : The total of the existing respective proxies of the same line, except the 1st proxy from the immediate lower-line, should be written.

First upper-line of 1-DCPs :

No. of the house	1st Proxy of the lower line	2nd Proxy	4th Proxy	6th Proxy	8th Proxy	Total
1	1	-	-	-	-	1
2	0	-	-	-	-	0
3	1	1	-	-	-	2
4	0	0	-	-	-	0
5	2	2	1	-	-	5
6	0	0	0	-	-	0
7	4	5	2	1	-	12
8	0	0	0	0	-	0
9	8	12	5	2	1	28
10	0	0	0	0	0	0
11	15	28	12	5	2	62
12	0	0	0	0	0	0

2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 1st proxies from the immediate lower-line, should be written.

No. of the house	1st Proxy of the lower line		2nd Proxy		4th Proxy		6th Proxy		8th Proxy		Total
	S	M	S	M	S	M	S	M	S	M	
1	1	-	-	-	-	-	-	-	-	-	1
2	0	0	-	-	-	-	-	-	-	-	0
3	1	1	1	1	-	-	-	-	-	-	4
4	0	0	0	0	-	-	-	-	-	-	0
5	2	3	2	4	1	1	-	-	-	-	13
6	0	0	0	0	0	0	-	-	-	-	0
7	4	8	5	13	2	4	1	1	-	-	38
8	0	0	0	0	0	0	0	0	-	-	0
9	8	20	12	38	5	13	2	4	1	1	104
10	0	0	0	0	0	0	0	0	0	0	0
11	15	47	28	104	12	38	5	13	2	4	268
12	0	0	0	0	0	0	0	0	0	0	0

In the above manner, basing upon their respective proxies the figures of 'Saṅkhya and Mahāpātāḷa' should be written for all the other remaining tables.

T.3. TABLE OF LAGHU (LAGHU-MĒRU)

	1	2	3	4	5	6	7	8	9	10	11	12	
		1	2	3	4	7	12	21	34	56	90	145	1
		1	4	9	16	29	54	101	182	322	560	965	
1	1	1	1	2	3	5	7	11	16	24	35	53	0
	1	2	3	5	9	16	27	45	74	121	195	314	

Key-rules :

Lowest-line :

1. **Saṅkhya** : The total of the existing respective proxies, except the 2nd proxy, it being the table of 2nd Aṅga, should be written (refer table-3).
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 2nd proxies, they being the houses of 2nd Aṅga, should be written.

Upper-lines :

1. **Saṅkhya** : The total of the existing respective proxies, except the 2nd proxy from the immediate lower-line, should be written.

2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 2nd proxies from the immediate lower-line, should be written.

T.4. TABLE OF GURU (GURU-MĒRU)

	1	2	3	4	5	6	7	8	9	10	11	12	
				1	2	5	10	20	38	73	136	255	1
				1	4	13	34	82	184	399	836	1719	
1	1	2	3	5	8	14	23	40	67	114	192	325	0
	1	3	7	15	30	59	113	215	403	750	1382	2531	

Key-rules :

Lowest-line :

1. **Saṅkhya** : The total of the existing respective proxies, except the 3rd proxy, it being the table of 3rd Aṅga, should be written (refer table-4).
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 3rd proxies, they being the houses of 3rd Aṅga, should be written.

Upper-lines :

1. **Saṅkhya** : The total of the existing respective proxies, except the 3rd proxy from the immediate lower line, should be written.
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 3rd proxies from the immediate lower-line, should be written.

T.5. TABLE OF PLUTA (PLUTA-MĒRU)

	1	2	3	4	5	6	7	8	9	10	11	12	
						1	2	5	10	22	44	89	1
						1	4	13	34	86	202	461	
1	1	2	3	6	10	18	31	56	98	174	306	542	0
	1	3	7	16	34	71	143	286	562	1096	2114	4054	

Key-rules :

Lowest-line :

1. **Saṅkhya** : The total of the existing respective proxies, except the 4th proxy, it being the table of 4th Aṅga, should be written (refer table-5).
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 4th proxies, they being the houses of 4th Aṅga, should be written.

Upper-lines :

1. **Saṅkhya** : The total of the existing respective proxies, except the 4th proxy from the immediate lower-line, should be written.

2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 4th proxies from the immediate lower-line, should be written.

T.6. TABLE OF KĀKAPĀDA (KĀKAPĀDA-MĒRU)

	1	2	3	4	5	6	7	8	9	10	11	12	
								1	2	5	10	22	1
								1	4	13	34	86	
1	1	2	3	6	10	19	33	60	106	191	340	610	0
	1	3	7	16	34	72	147	298	592	1169	2282	4431	

Key-rules :

Lowest-line :

1. **Saṅkhya** : The total of the existing respective proxies, except the 5th proxy, it being the table of 5th Aṅga, should be written (refer table-6).
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 5th proxies, they being the houses of the 5th Aṅga, should be written.

Upper-lines :

1. **Saṅkhya** : The total of the existing respective proxies, except the 5th proxy from the immediate lower-line, should be written.
2. **Mahāpātāḷa** : The total of the existing respective proxies of both 'Saṅkhya and Mahāpātāḷa', except the 5th proxies from the immediate lower-line, should be written.

T. 7. TABLE OF COMBINATIVE AṅGAS (SAMĀYŌGA-MĒRU)

The details of the series of both individual Aṅgas and the interbred combinations of different Aṅgas of all modes of permutation under systematic groups are furnished in the 'List of Combinative aṅgas'. Among them basing upon the series of combinations furnished in the above table pertaining to Pañcāṅga-prastāra the table of combinative Aṅgas i.e.. Saṅyōga-mēru has to be written (refer table-7).

Key-rules :

1. Saṅkhya :

- A. For the vertical lines of IAEPs (Identical-aṅga-ending-permutations) of individual Aṅgas write the figure "1" in each of the houses pertaining to the respective proxy and its multiples of the Aṅga concerned.
- B. For the vertical lines consisting the combinations of two Aṅgas or more the total of the existing upper proxies representing the respective Aṅgas of the same vertical line besides the corresponding serial figures of the vertical lines pertaining to the respective interbred combinations like IAEPs of double-aṅga combinations, duplets of triple-aṅga combinations, triplets of quadruple-aṅga combinations, quadruplets of quintuple-aṅga combinations, quintuplets of sextuple-aṅga combinations and so on, should be written.

Example:

1. D-line : The total number of ADEPS (All-druta-ending-permutations) is furnished in this line and as per rule No.A write figure '1' only in each house consecutively since the proxy of Druta is '1'.
2. L-line : The total number of ALEPs is furnished in this line and as per rule No.A write figure "1" only in each of the 2nd house of this line since the proxy of Laghu is '2'.
3. DL-line : The total number of prastāras derived from the interbred combinations of Druta and Laghu i.e., combination containing either Druta-Laghu or Laghu-Druta, is furnished in this line and as per rule No.B write the total of the figures of the existing upper 1st and 2nd proxies representing Druta and Laghu respectively of the same vertical line besides the corresponding serial figures of the vertical lines of IAEPs of both Druta and Laghu.

1st house : Being the 1st house of which the upper proxies of the same vertical line are absent, write the total of the figures of the 1st house of the vertical lines of IAEPs of both Druta (1) and Laghu (1) thus arriving at a grand total (1+1) 2.

2nd house : Write the total of the figures of the existing upper 1st proxy (2) representing Druta of the same vertical line (2nd proxy is absent) besides the corresponding 2nd figures (being the 2nd house) of the vertical lines of IAEPs of both Druta (1) and Laghu (0) thus arriving at a grand total (2+1+0=)3.

3rd house : Write the total of the figures of the existing upper 1st (3) and 2nd (2) proxies representing Druta and Laghu respectively of the same vertical line besides the corresponding 3rd figures (being the 3rd house) of the vertical lines of IAEPs of both Druta (1) and Laghu (1) thus arriving at a grand total (3+2+1+1=)7.

4th house : Write the total of the figures of the existing upper 1st (7) and 2nd (3) proxies representing Druta and Laghu respectively of the same vertical line besides the corresponding 4th figures (being the 4th house) of the vertical lines of IAEPs of both Druta (1) and Laghu (0) thus arriving at a grand total (7+3+1+0=)11.

No. of the house	Upper figure of		Sl. figure of		Total
	1st	2nd	ADEP	ALEP	
1	-	-	1	1	2
2	2	-	1	0	3
3	3	2	1	1	7
4	7	3	1	0	11
5	11	7	1	1	20
6	20	11	1	0	32
7	32	20	1	1	54
8	54	32	1	1	87
9	87	54	1	1	143
10	143	87	1	0	231

In the same manner figures upto the required prastāra of the same line and also for the other vertical lines pertaining to the combinations of two Aṅgas or more could be written.

- 4.G-line : The total number of AGEPs is furnished in this line and as per rule No.A write figure '1' only in each of the 4th house of this line since the proxy of Guru is '4'.
- 5.DG-line : The total number of the interbred combinations of Druta and Guru is furnished in this line and as per rule No.B write the total of the figures of the existing upper 1st and 4th proxies representing Druta and Guru respectively of the same vertical line besides the corresponding serial figures of the vertical lines of the IAEPs of both Druta and Guru.
- 6.LG-line : The total number of the interbred combinations of Laghu and Guru is furnished in this line and as per rule No.B write the total of the figures of the existing upper 2nd and 4th proxies representing Laghu and Guru respectively of the same vertical line besides the corresponding serial figures of the vertical lines of the IAEPs of both Laghu and Guru.
- 7.P-line : The total number of APEPs in furnished in this line and as per rule No.A write figure '1' only in each of the 6th house since the proxy of Pluta is '6'.
- 8.DLG-line : The total number of the interbred combinations of Druta, Laghu and Guru is furnished in this line and as per rule No.B write the total of the existing upper 1st, 2nd and 4th proxies representing Druta, Laghu and Guru respectively of the same vertical line besides the corresponding serial figures of the vertical lines of DL, DG and LG.

No. of the house	Upper figure of			Sl. figure of			Total
	1st	2nd	4th	DL	DG	LG	
1	-	-	-	2	2	2	6
2	6	-	-	3	3	0	12
3	12	6	-	7	4	3	32
4	32	12	-	11	5	0	60
5	60	32	6	20	9	7	134
6	134	60	12	32	13	0	251

1st house : Being the 1st house as no upper proxies in the same vertical line are existing write the total of the figures of each of the corresponding 1st house (being the 1st house) of the vertical lines of DL (2), DG (2) and LG (2) thus arriving at a grand total (2+2+2=)6.

2nd house : Write the total of the existing upper 1st proxy (6) representing Druta of the same vertical line (2nd proxy is absent) besides the figures of each of the corresponding 2nd house (being the 2nd house) of the vertical lines of DL (3), DG (3) and LG (0) thus arriving at a grand total (6+3+3+0=)12.

3rd house : Write the total of the existing upper 1st (12) and 2nd (6) proxies representing Druta and Laghu respectively of the same vertical line besides the figures of each of the corresponding 3rd house (being the 3rd house) of the vertical lines of DL (7), DG (4) and LG (3) thus arriving at a grand total (12+6+7+4+3=)32.

4th house : Write the total of the existing upper 1st (32) and 2nd (12) proxies representing Druta and Laghu respectively of the same vertical line besides the figures

of each of the corresponding 4th house (being the 4th house) of the vertical lines of DL (11), DG (5) and LG (0) thus arriving at a grand total $(32+12+11+5+0=)$ 60.

5th house : Write the total of the existing upper 1st (60), 2nd (32) and 4th (6) proxies representing Druta, Laghu and Guru respectively of the same vertical line besides the figures of each of the corresponding 5th house (being the 5th house) of the vertical lines of DL (20), DG (9) and LG (7) thus arriving at a grand total $(60+32+6+20+9+7=)$ 134.

In the same manner the figures upto the required prastāra and also of the other lines pertaining to the other combinations of Aṅgas could be written.

- 9.DP-line : The total number of the interbred combinations of Druta and Pluta is furnished in this line and as per rule No.B write the total of the figures of the existing upper 1st and 6th proxies representing Druta and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of the IAEPs of both Druta and Pluta.
- 10.LP-line : The total number of the interbred combinations of Laghu and Pluta is furnished in this line and as per rule No.B write the total of the figures of the existing upper 2nd and 6th proxies representing Laghu and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of the IAEPs of both Laghu and Pluta.
- 11.K-line : The total number of AKEPs is furnished in this line and as per rule No.A write figure '1' only in each of the 8th house since the proxy of Kākapāda is '8'.
- 12.DLP-line : The total number of the interbred combinations of Druta, Laghu and Pluta is furnished in this line and as per rule No.B write the total of the existing upper 1st, 2nd and 6th proxies representing Druta, Laghu and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of DL, DP and LP.
- 13-DK-line : The total number of the interbred combinations of Druta and Kākapāda is furnished in this line and as per rule No.B write the total of the figures of the existing upper 1st and 8th proxies representing Druta and Kākapāda respectively of the same vertical line besides the corresponding serial figures of the vertical lines of IAEPs of both Druta and Kākapāda.
- 14.GP-line : The total number of the interbred combinations of Guru and Pluta is furnished in this line and as per rule No.B write the total of the figures of the existing upper 4th and 6th proxies representing Guru and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of IAEPs of both Guru and Pluta.
- 15.LK-line : The total number of the interbred combinations of Laghu and Kākapāda is furnished in this line and as per rule No.B write the total of the figures of the existing upper 2nd and 8th proxies representing Laghu and Kākapāda respectively of the same vertical line besides the corresponding serial figures of the vertical lines of IAEPs of both Laghu and Kākapāda.

- 16.DGP-line : The total number of the interbred combinations of Druta, Guru and Pluta is furnished in this line and as per rule No.B write the total of the existing upper 1st, 4th and 6th proxies representing Druta, Guru and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of DG, DP and GP.
- 17.DLK-line : The total number of the interbred combinations of Druta, Laghu and Kākapāda is furnished in this line and as per rule No.B write the total of the existing upper 1st, 2nd and 8th proxies representing Druta, Laghu and Kākapāda respectively of the same vertical line besides the corresponding serial figures of the vertical lines of DL, DK and LK.
- 18.LGP-line : The total number of the interbred combinations of Laghu, Guru and Pluta is furnished in this line and as per rule No.B write the total of the existing upper 2nd, 4th and 6th proxies representing Laghu, Guru and Pluta respectively of the same vertical line besides the corresponding serial figures of the vertical lines of LG, LP and GP.
- 19.GK-line : The total number of the interbred combinations of Guru and Kākapāda is furnished in this line and as per rule No.B write the total of the figures of the existing upper 4th and 8th proxies representing Guru and Kākapāda respectively of the same vertical line besides the corresponding serial figures of the vertical lines of IAEPs of both Guru and Kākapāda.

In the same manner the figures of all the other tables of combinative Aṅgas could be written.

2. Mahāpātāḷa:

- A. For the vertical lines of IAEPs of individual Aṅgas write figures serially in ascending order of value, starting from figure '1' and onwards towards Mahāpātāḷa under each figure '1' of Saṅkhya of each and every Aṅga leaving away the zeros, if any, in-between.
- B. For the vertical lines pertaining to the combinations of two Aṅgas or more the total of both Saṅkhya and Mahāpātāḷa of the existing upper proxies representing the respective Aṅgas of the same vertical line besides both Saṅkhya and Mahāpātāḷa of the corresponding serial houses of the vertical lines pertaining to the respective interbred combinations like IAEPs of double-aṅga combinations, duplets of the triple-aṅga combinations, triplets of the quadruple-aṅga combinations, quadruplets of the quintuple-aṅga combinations, quintuplets of the sextuple-aṅga combinations and so on should be written.

- 1.D-line : As per rule No.A write figures serially in ascending order of value starting from figure '1' and onwards under each figure '1' of Saṅkhya.
2. L-Line : As per rule No.A write figures serially in ascending order of value starting from figure '1' and onwards under each figure '1' of Saṅkhya leaving away the zeros in-between.
3. DL-line : As per rule No.B write the total of both Saṅkhya and Mahāpātāḷa of the existing upper 1st and 2nd proxies representing Druta and Laghu respectively of the same vertical line besides both Saṅkhya and Mahāpātāḷa of the corresponding serial figures of the vertical lines of IAEPs of Druta and Laghu.

1st house : Being the 1st house of which the upper proxies of the same vertical line are absent, write the total of both Saṅkhya and Mahāpātāḷa of each of the corresponding 1st figures (being the 1st house) of the vertical lines pertaining to

IAEPs of both Druta (1+1=2) and Laghu (1+1+=2) thus arriving at a grand total (2+2=4).

2nd house : Write the total of both Saṅkhya and Mahāpātāḷa of the existing upper 1st proxy (2+4=6) representing Druta of the same vertical line (2nd proxy is absent) besides the total of both Saṅkhya and Mahāpātāḷa of the corresponding 2nd figures (being the 2nd house) of each of the vertical lines pertaining to IAEPs of Druta (1+2=3) and Laghu (0+0=0) thus arriving at a grand total (6+3+0=9).

3rd house : Write the total of both Saṅkhya and Mahāpātāḷa of the existing upper 1st (3+9=12) and 2nd (2+4=6) proxies representing Druta and Laghu respectively of the same vertical line besides the total of both Saṅkhya and Mahāpātāḷa of the corresponding 3rd figures (being the 3rd house) of each of the vertical lines pertaining to IAEPs of Druta (1+3=4) and Laghu (1+2=3) thus arriving at a grand total (12+6+4+3=)25.

4th house : Write the total of both Saṅkhya and Mahāpātāḷa of the existing upper 1st (7+25=32) and 2nd (3+9=12) proxies representing Druta and Laghu respectively of the same vertical line besides the total of both Saṅkhya and Mahāpātāḷa of the corresponding 4th figures (being the 4th house) of each of the vertical lines pertaining to IAEPs of Druta (1+4=5) and Laghu (0+0=0) thus arriving at a grand total (32+12+5+0)=49.

No. of the house	Upper figure of				Sl. figure of				Total
	1st	-	2nd		ADEP	-	ALEP		
	S	M	S	M	S	M	S	M	
1	-	-	-	-	1	1	1	1	4
2	2	4	-	-	1	2	0	0	9
3	3	9	2	4	1	3	1	2	25
4	7	25	3	9	1	4	0	0	49
5	11	49	7	25	1	5	1	3	102
6	20	102	11	49	1	6	0	0	189
7	32	189	20	102	1	7	1	4	356
8	54	356	32	189	1	8	0	0	640
9	87	640	54	356	1	9	1	5	1153
10	143	1153	87	640	1	10	0	0	2034

In the same manner figures upto the required prastāra and also of other lines pertaining to the other combinations of Aṅgas could be written.

4. G-line : As per rule No.A write figures serially in ascending order of value starting from figure '1' and onwards under each figure '1' of Saṅkhya leaving away the zeros in-between.
5. DG-line : As per the rule No.B write the total of both Saṅkhya and Mahāpātāḷa of the existing upper 1st and 4th proxies representing Druta and Guru respectively of the same

vertical line besides both Saṅkhyā and Mahāpātāḷa of the corresponding serial figures of the vertical lines of IAEPs of Druta and Guru.

6. LG-line : As per the rule No.B write the total of both Saṅkhyā and Mahāpātāḷa of the existing upper 2nd and 4th proxies representing Laghu and Guru respectively of the same vertical line besides both Saṅkhyā and Mahāpātāḷa of the corresponding serial figures of the vertical lines of IAEPs of Laghu and Guru.
7. P-line : As per rule No.A write figures serially in ascending order of value starting from figure '1' and onwards under each figure '1' of Saṅkhyā and leaving away the zeros in-between.
8. DLG-line : As per rule No.B write the total of both Saṅkhyā and Mahāpātāḷa of the existing upper 1st, 2nd and 4th proxies representing Druta, Laghu and Guru respectively of the same vertical line besides both Saṅkhyā and Mahāpātāḷa of the corresponding serial figures of the vertical lines of DL, DG and LG.

No. of the house	Upper figure of						Sl. figure of						Total
	1st		2nd		4th		DL		DG		LG		
	S	M	S	M	S	M	S	M	S	M	S	M	
1	-	-	-	-	-	-	-	4	2	4	2	4	18
2	6	18	-	-	-	-	-	9	3	9	0	0	48
3	12	48	6	18	-	-	7	25	4	16	3	9	148
4	32	148	12	48	-	-	11	49	5	25	0	0	330
5	60	330	32	148	6	18	20	102	9	45	7	25	802
6	134	802	60	330	12	48	32	189	13	73	0	0	1693

In the same manner figures upto the required prastāra of the same line and also for the other vertical lines pertaining to the other combinations could be written.

3.2. ṢAḌAṄGA-PRASTĀRA

In this mode of the Ṣaḍaṅga-prastāra all the six Aṅgas i.e., Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda are used in the process of permutation. While Druta is the inferior (least) Aṅga in Pañcāṅga-prastāra the Anudruta is the inferior Aṅga in this Ṣaḍaṅga-prastāra. So, in this mode of permutation the process of permutation should always be continued on the lines of Pañcāṅga-prastāra until all the Aṅgas become the inferior Aṅgas, Anudrutas. Hence this last prastāra is called AAEP (All-anudruta-ending-permutation). This mode of permutation should be applied to all the jātis i.e., Trisra, Caturaśra, Khaṇḍa, Miśra and Saṅkīrṇa jātis, and all the required figures of all the different tables could be obtained basing upon the respective proxies (refer the 'Important technical-terms, abbreviations and signs' furnished in the beginning of this book) representing the six Aṅgas respectively.

Relevant tables and examples pertaining to the process of permutation of Akhaṇḍa and Khaṇḍa-prastāras are furnished at the end of this book.

If needed the relevant details of all other Viśeṣa-jātis (6, 8, 10, 12 & 16-units) also could be obtained basing upon the multiples of the respective proxies in the same manner.

3.3. SAMYUKTĀṄGA-PRASTĀRA

In the process of the Saṁyuktāṅga-prastāra, in addition to the usual six Aṅgas i.e., Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda, various other combinations of two or more of these six Aṅgas, formed by interlacing and writing one above the other, are also used. The synonyms of this mode of permutation are 'Miśramāṅga-prastāra' and 'Miśritāṅga-prastāra'. In this process of permutation, while following, as usual, the general rules of permutation, write an Aṅga lesser by one unit than the above. In this mode of permutation an interlaced Aṅga should instantaneously be prepared, if necessary (like 'Tri-druta-virāma' for the value of 7-units in Saṅkīrṇa-jāti or 'Laghu-dvi-druta' for the value of 9-units in Khaṇḍa-jāti or 'Pluta-dvi-druta-virāma' for the value of 26-units in Miśra-jāti). While, in the other modes of permutation the process of permutation is applied with the Aṅgas basing upon their respective jātis, independent or interlaced Aṅgas for any number of units could be framed and used in this process of permutation. To make this process of permutation easier to understand numerals i.e., 1, 2, 3, 4, 5, 6 etc., only are used and, if needed, they could be transliterated into independent or interlaced Aṅgas according to the requirement of units.

Important-note : In this mode of permutation Virāma is not used in the sense of its textual tradition, but it is equated to one-unit of time appended to another Tālāṅga.

Proxies : The figures of all the preceding houses are the proxies in this mode of permutation. In this mode of permutation tables should be prepared for 1-unit, 2-units, 3-units and so on for each and every unit in ascending order of value and the respective unit-number of that particular table is the proxy of that table which should be taken into account from the immediate lower-line for writing the figures of the upper-lines only (but not for the lowest-lines at all).

Relevant tables and examples pertaining to the process of permutation of Akhaṇḍa-prastāra and Khaṇḍa-prastāra are furnished at the end of this book.



4. EXAMPLES OF NAṢṬA, UDDIṢṬA & KALITA

Note : Follow item No.32 of the 'Important technical-terms, abbreviations & signs.'

Sl. No.	Particulars	Naṣṭa	Uddiṣṭa	Kalita
A. AKHAṆḌA-PRASTĀRA				
1.	Akhaṇḍa-anulōma-	2-12-632-1, 385; 3-11-565-318; 4-12-543-148; 5-12-377-170; 7-12-271-113; 9-12-243-2; 1-8-128-67.	2-12-632-10ṢII; 3-12-1059-SIOU; 4-12-543-1010; 5-12-377-U11U; 7-12-271-U0UU0UU0U; 9-12-243-OUOU0U0U; 1-12-2048-2 1 1 2 1 1 2 1 1.	2-8-61-50.
2.	Akhaṇḍa-anulōma-madhyarūpa-uparisthita-	2-6-19-6; 2-5-10-2.	2-6-19-SI; 2-5-10-101.	
3.	Akhaṇḍa-anulōma-madhyarūpa-adhaṣṭhita-	2-6-19-8; 2-5-10-4.	2-6-19-10000; 2-5-10-1000.	
4.	Akhaṇḍa-vilōma-	2-12-632-632.	2-12-632-10Ṣ01.	
5.	Akhaṇḍa-vilōma-madhyarūpa-uparisthita-	2-5-10-2.	2-7-33-S000.	
6.	Akhaṇḍa-vilōma-madhyarūpa-adhaṣṭhita-	2-7-33-12.	2-5-10-011.	
B. KHAṆḌA-PRASTĀRA				
7.	Khaṇḍa-hīna-anulōma-	2-12-1-0-29-12,16; 2-10-2-0-24-2,7; 1-9-1-0-21-1,6,12,19; 1-7-2-0-21-18.	2-12-1-0-29-ṢṢ, ṢIS,SISI, +II.	2-12-1-0-29-20.
8.	Khaṇḍa-hīna-anulōma-madhyarūpa-uparisthita-	2-12-1-0-29-3; 2-8-1-0-8-2.	2-8-1-0-8-ISI.	
9.	Khaṇḍa-hīna-anulōma-madhyarūpa-adhaṣṭhita-	2-12-1-0-29-1; 2-8-1-0-8-3.	2-12-1-0-29-+S.	

Sl. No.	Particulars	Naṣṭa	Uddiṣṭa	Kalita
10.	Khaṇḍa-hīna-vilōma-	2-12-1-0-29-18.	2-12-1-0-29-ISIS.	
11.	Khaṇḍa-hīna-vilōma-madhyarūpa-uparisthita-	2-8-1-0-8-2.	2-12-1-0-29-ISIS; 2-8-1-0-8-IŚ.	
12.	Khaṇḍa-hīna-vilōma-madhyarūpa-adhaṣṭhita-	2-12-1-0-29-8.	2-12-1-0-29-SŚI; 2-8-1-0-8-SII.	
13.	Khaṇḍa-yukta-anulōma-	2-8-1-2-25-2,3,5,9,12,15,17,18,20,23,24; 2-8-2-1-21-3,8,13,18; 2-8-4-1-20-4,9; 2-10-6-1-22-5, 11; 2-12-8-1-22-5,11; 3-10-6-1-26-17; 4-8-4-1-20-16; 5-10-2-1-29-8; 7-12-2-1-31-11; 9-9-1-5-21-10, 17; 1-8-1-1-26-7,9, 11,14,16; 1-7-2-1-26-12, 17.	2-9-1-1-28-I0Ś, S0S, S0II; 2-8-1-2-25-0I0S; 3-10-1-1-32-SIU; 1-8-1-1-26-2 3 1 2; 4 3 1.	2-8-1-2-25-20
14.	Khaṇḍa-yukta-anulōma-madhyarūpa-uparisthita-	2-8-1-2-25-4; 2-9-1-1-28-7.	2-9-1-1-28-0ŚI.	
15.	Khaṇḍa-yukta-anulōma-madhyarūpa-adhaṣṭhita-	2-8-12-25-7; 2-9-1-1-28-9.	2-8-1-2-25-Ś00.	
16.	Khaṇḍa-yukta-vilōma-	2-8-1-2-25-21.	2-8-1-2-25-00SI.	
17.	Khaṇḍa-yukta-vilōma-madhyarūpa-uparisthita	2-8-1-2-25-9.	2-9-1-1-28-SSO.	
18.	Khaṇḍa-yukta-vilōma-madhyarūpa-adhaṣṭhita-	2-9-1-1-28-11.	2-9-1-1-28-S0S.	

Chapter - 4

NAṢṬA, UDDIṢṬA & KALITA

In order to avoid the Himalayan task of undertaking the processes of all the permutations for which a human life is too short some very interesting and important easy methods are furnished in this chapter to obtain (a) the series of Aṅgas of a particular number of prastāra in question, (b) the serial number of a particular prastāra in question containing a particular series of Aṅgas and (c) the details of all the Aṅgas used upto a particular number of prastāra in question with the help of some figures. They are named as 'Naṣṭa, Uddiṣṭa and Kalita' respectively which are elaborated hereunder along with the relevant rules and examples.

4.1. NAṢṬA

The easy method of obtaining the series of Aṅgas of a prastāra containing a particular serial number in question with the help of the figures of 'Saṅkhya' is called 'Naṣṭa'.

RULES FOR ANSWERING NAṢṬA

1. Write the 'Saṅkhya' line of figures upto the required units of permutation.
2. (a) Anulōma-naṣṭa : Subtract the question number from the Saṅkhya and later from the remainder subtract the respective proxies consecutively.
 - (i) Anulōma-madhyarūpa-uparisthita-naṣṭa : Add the Vilōma-question-number to the MN and for the odd-numbers of Saṅkhya further subtract figure '1' and later from the last remainder subtract the respective proxies.
 - (ii) Anulōma-madhyarūpa-adhaṣṭhita-naṣṭa : From the MN subtract the Anulōma-question-number and for the odd-numbers of Saṅkhya further subtract figure '1' also later from the last remainder subtract the respective proxies.
- (b) Vilōma-naṣṭa : Subtract figure '1' from the question-number and later from the remainder subtract the respective proxies.
 - (i) Vilōma-madhyarūpa-uparisthita-naṣṭa: From the MN subtract the Vilōma-question-number and also figure '1' and later from the last remainder subtract the respective proxies.
 - (ii) Vilōma-madhyarūpa-adhaṣṭhita-naṣṭa : Add the Anulōma-question-number to the MN and subtract figure '1' and later from the last remainder subtract the respective proxies.
3. If the first proxy is not subtracted write the Aṅga of the first proxy and the same process should be continued until a proxy is subtracted.
4. For the successful subtraction of the 1st proxy consider the 'non-subtraction' of the 2nd proxy only, for the successful consecutive subtraction of the 1st & 2nd proxies consider the 'non-subtraction' of the 4th proxy only, for the successful consecutive subtraction of the 1st, 2nd & 4th proxies consider the 'non-subtraction' of the 6th proxy only and for the successful consecutive subtraction of the 1st, 2nd, 4th & 6th proxies consider the 'non-subtraction' of the 8th proxy only thus considering only the 'non-subtraction' of the last proxy and leaving it off write the Aṅga of it and start again fresh the process of subtraction by subtracting the relevant proxies of the 'un-subtracted-proxy'. In the absence of the remainder no figure is needed to be left off. In respect

of the table of 1-unit of Saṃyuktāṅga-khaṇḍa-prastāra the house of 'zero' also, along with its succeeding proxy, should be taken into account.

- 5 (a) After getting (i) an un-deducted proxy or (ii) a left-off proxy further Aṅgas should be written basing upon the respective proxies of such un-deducted or left-off proxy by subtracting them consecutively starting process again from the beginning and carefully observing the relevant rules and restrictions, if any, in writing the Aṅgas.
- (b) For the upper-lines of the tables of all Aṅgas sometimes, if carefully observed, Aṅgas of higher value should have to be written than the Aṅga probable for the subtraction of two or more proxies of the same line or for the subtraction of the figure '1' of the extreme left, either independently or consecutively along with other proxies.
- (c) Aṅgas should always be written by subtracting the existing respective proxies only but carefully observing the relevant rules and restrictions, if any.
- 6 (a) In all modes of permutation for answering Naṣṭa of Akhaṇḍa-prastāra, if either the remainder or proxy or both are not existing, one or more inferior (least) Aṅgas should only be written to fill-in the deficit value of the prastāra.
- (b) In all modes of permutation for answering Naṣṭa of Khaṇḍa-prastāra, for all the tables of Aṅgas, except the tables of the lowest Aṅgas, one or more lowest Aṅgas should only be written for the lowest-lines and for the upper-lines, either the lowest Aṅga or the Aṅga of that particular table or both, should be written anti-clock-wise, in ascending order of value, irrespective of the number of the Aṅgas to fill-in the deficit value of the prastāra. While doing so the relevant rules and restrictions, if any, should be observed in writing the Aṅgas to fill-in the deficit value of the prastāra.
- (c) In Pañcāṅga-prastāra for answering Naṣṭa of Khaṇḍa-prastāra, for Druta-mēru, which is the table of the inferior (lowest) Aṅga, one or more Laghus, Laghu being the next immediate higher Aṅga than Druta, should only be written for the lowest-line as this is the line containing only DDPs (Druta-devoid-permutations). For the upper-lines, as Druta plays a dual role of both the lowest Aṅga of that mode and the Aṅga of that particular table as well, either Druta or Laghu or both should be written, in ascending order of value, irrespective of the number of the Aṅgas, to fill-in the deficit value of the prastāra.
- (d) In Ṣaḍaṅga-prastāra for answering Naṣṭa of Khaṇḍa-prastāra, for Anudruta-mēru, which is the table of the inferior (lowest) Aṅga of that mode, one or more Drutas, Druta being the next immediate higher Aṅga than Anudruta, should be written for the lowest-line, as this is the line containing only ADPs (Anudruta-devoid-permutations). For the upper-lines, as Anudruta plays a dual role of both the lowest Aṅga of that mode and the Aṅga of that particular table as well, either Anudruta or also with Druta or also with Laghu, should be written, in ascending order of value, irrespective of the number of Aṅgas, to fill-in the deficit value of the prastāra. Besides, it should be well remembered that one or more Laghus also have to be written, if found necessary, for both the lowest and upper-lines of this table of Anudruta.
- (e) In Saṃyuktāṅga-prastāra for answering Naṣṭa of Khaṇḍa-prastāra, for the table of one-unit (Ēka-anudruta-mēru), which is the table of the lowest-unit of that mode and in which the house of the 'zero' also, along with its succeeding proxy, should be accounted for writing the relevant Aṅgas one or more Aṅgas of 2-units, they being the immediate higher Aṅgas than the Aṅgas of 1-unit, should be written for the lowest-line, as this is the line

containing only 1-UDPs (one-unit-devoid-permutations). For the upper-lines, as the Aṅga of one-unit plays a dual role of both the lowest Aṅga of that mode and the Aṅga of that particular table as well, Aṅgas of 1-unit or 2-units or both should be written, in ascending order of value, irrespective of the number of the figures, to fill-in the deficit value of the prastāra. Besides, it should be well remembered that one or more Aṅgas of 3-units also have to be written, if found necessary, for the lowest and upper-lines of this table.

- 7 (a) In all modes of permutation, in respect of the upper-lines of the table of any Aṅga, other than the lowest, if the process of subtraction continues upto the lowest-line, further Aṅgas should always be written as per the key-rules governing the lowest-line only.
- (b) In all modes of permutation, for the upper-lines of the very first table of the lowest Aṅga, if the process of subtraction continues upto the lowest line and any figure of that line cannot be subtracted, one lowest Aṅga should be written at the first instance and further Aṅgas be written later as per the key-rules governing the lowest-line only.

EXAMPLES

A. AKHAṆḌA-PRASTĀRA

1. Akhaṇḍa-anulōma-naṣṭa :

1. What is the series of Aṅgas pertaining to the 1st prastāra of 12-DP of Pañcāṅga-prastāra? (2-12-632-1)

To write the 'Saṅkhyā' of Pañcāṅga-prastāra, the total of the existing figures of the preceding 1st, 2nd, 4th, 6th and 8th houses, which are the fixed respective proxies of Pañcāṅga-prastāra, should always be written and now, as per rule No.1 write the figures of 'Saṅkhyā' upto the required 12-DP (refer table -1).

Now as per rule No.2 (a), subtract the question number '1', from the 'Saṅkhyā' figure '632' of 12-DP as the question number belongs to the 12-DPs and the remainder (632-1) is '631'.

Now, from the above remainder '631', the respective proxies (the figures of the preceding 1st, 2nd, 4th, 6th and 8th houses i.e., first-1st proxy, second-2nd proxy, third-4th proxy, fourth-6th proxy and fifth-8th proxy of the figure '632', the 'Saṅkhyā' of 12-DP) should consecutively be subtracted as this figure '632' is only the combination of all these five proxies. So, accordingly, from the above remainder '631', the first - 1st proxy '350' ($631-350=281$), the second-2nd proxy '196' ($281-196=85$), the third-4th proxy '61' ($85-61=24$) and the fourth-6th proxy '19' ($24-19=5$) could consecutively be subtracted, as per rule No.4 write the fifth consecutive Aṅga (1st-Druta, 2nd-Laghu, 3rd-Guru, 4th-Pluta and 5th-Kākapāda), Kākapāda, in total, and leave away the fifth-8th proxy '6' (as this figure '6' could not consecutively be subtracted from the last remainder '5', being a figure bigger than the remainder, this figure '6' becomes the figure to be left-off, after obtaining the Aṅga, Kākapāda).

Now, as per rule No.5 (a), we have to start the process of subtraction again from the beginning by consecutively deducting the respective preceding proxies of the above left-off proxy and accordingly, from the remainder '5', the first-1st proxy '3' ($5-3=2$) and the second-2nd proxy '2' ($2-2=0$) of the above left-off proxy '6', could consecutively be subtracted and as per rule No.4, as two proxies could consecutively be subtracted, write the third consecutive Aṅga, Guru.

Till now we have obtained Kākapāda and Guru. Now, as no remainder is left and as also the total value of Kākapāda and Guru together is tallied with the value of 12-DP, the process of subtraction is over and thus the series of aṅgas of this 1st prastāra of 12-DP consists of 'S+'.

2. What is the series of Aṅgas pertaining to the 385th prastāra of 12-DP? (2-12-632-385)

As per rule No.1 write Saṅkhya upto the required permutation.

Now, as per rule No.2 (a), the remainder (632-385) is '247'.

Later, as per rule No.3, as the first -1st proxy '350', being a figure bigger than the above remainder '247', could not be subtracted from the remainder, write Druta of the same first-1st proxy.

Now, as per rule No.5(a), we have to start the process of subtraction again from the beginning by consecutively deducting the respective preceding proxies of the above un-deducted proxy and accordingly from the above remainder '247', the first-1st proxy '196' of the above un-deducted proxy '350' could only be subtracted ($247-196=51$) and as per rule No.4, as only one proxy could be subtracted, write the second consecutive Aṅga, Laghu and leave away the second -2nd proxy '108' of the above un-deducted proxy '350' (had '108' also been subtracted consecutively along with '196', we would have got the third consecutive Aṅga, Guru, for the consecutive subtraction of two proxies, but, as '108' could not consecutively be subtracted, being a figure bigger than the last remainder '51', this '108', has become the figure to be left-off).

Now, again as per rule No.5(a), we have to start the process of subtraction again from the beginning by consecutively deducting the respective preceding proxies of the above last left-off proxy. But, accordingly, from the last remainder '51', as even the first -1st proxy '61' of the above left-off proxy '108' could not also be subtracted being a figure bigger than the remainder, as per rule No.3 write the Aṅga, Druta of the same first -1st proxy.

Now, again as per rule No.5 (a), we have to start the process of subtraction from the beginning by consecutively deducting the respective preceding proxies of the above last un-deducted proxy and accordingly now, from the last remainder '51', the first-1st proxy '33', of the above un-deducted proxy '61' could be subtracted ($51-33=18$) and as per rule No.4, as only one proxy could be subtracted, write the second consecutive Aṅga, Laghu and leave away the second -2nd proxy '19' of the above un-deducted proxy '61'.

Now, again as per rule No.5 (a), we have to start the process of subtraction again from the beginning by consecutively deducting the respective preceding proxies of the above last left-off proxy, and accordingly now, from the last remainder '18', the first-1st proxy '10' ($18-10=8$), the second-2nd proxy '6' ($8-6=2$) and the third-4th proxy '2' ($2-2=0$) of the above left-off proxy '19' could consecutively be subtracted and as per rule No.4, as three proxies could consecutively be subtracted, write the fourth consecutive Aṅga, Pluta. Till now, we have obtained Druta, Laghu, Druta, Laghu and Pluta consecutively. Now, as no remainder is left and as also the total value of all these above Aṅgas together is tallied with the value of 12-DP, now the process of subtraction is over and the series of this 385th prastāra of 12-DP consists of 'SIOIO'.

3. What is the series of Aṅgas pertaining to the 318th prastāra of 11-AP of Trisra-jāti of Ṣaḍaṅga-prastāra? (3-11-565-318)

To write the 'Saṅkhya' of Trisra-jāti of Ṣaḍaṅga-prastāra the total of the 1st, 2nd, 3rd, 6th, 9th and 12th proxies should be written and as per rule No.1 write the figures of 'Saṅkhya' upto the required permutation (refer table-8).

As per rule No.2 (a) the remainder (565-318) is '247'.

From this remainder '247', the first-1st proxy '302' could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

As per rule No.5(a), from the above remainder '247', the first-1st proxy '162' of the above un-deducted proxy '302', could only be subtracted ($247-162=85$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the second-2nd proxy '86'.

Now, again as per rule No.5 (a), from the last remainder '85', the first-1st proxy '46' ($85-46=39$), the second -2nd proxy '25' ($39-25=14$) and the third-3rd proxy '13' ($14-13=1$) of the above left-off proxy '86', could consecutively be subtracted and as per rule No.4 write the fourth consecutive Aṅga, Guru, leaving away the fourth-6th proxy '2'.

Again, as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'O S O U'.

4. What is the series of Aṅgas pertaining to the 148th prastāra of 12-AP of Caturaśra-jāti of Ṣaḍaṅga-prastāra? (4-12-543-148)

To write the 'Saṅkhyā' of Caturaśra-jāti of Ṣaḍaṅga-prastāra the total of the 1st, 2nd, 4th, 8th, 12th and 16th proxies should be written and as per rule No.1 write the figures of 'Saṅkhyā' upto the required permutation (refer table -16).

As per rule No.2(a) the remainder (543-148) is '395'.

From this above remainder the first-1st proxy '306' could only be subtracted ($395-306=89$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the second-2nd proxy '174'.

Later, as per rule No.5(a), from the last remainder '89', the first - 1st proxy '98' of the left-off proxy '174', could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Now, again as per rule No.5 (a), from the above remainder '89', the first-1st proxy '56' ($89-56=33$) and the second-2nd proxy '31' ($33-31=2$) of the above un-deducted proxy '98', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Laghu, leaving away the third-3rd proxy '10'.

Later, again as per rule No.5(a), from the last remainder '2', the first-1st proxy '6' of the above left-off proxy '10' and again the first-1st proxy '3' of the previously un-deducted proxy '6', thus two first-1st proxies could not consecutively be subtracted and as per rule No.3 write two Aṅgas, Anudrutas of the first-1st proxy consecutively.

Now, as per rule No.5 (a), from the remainder '2', the first-1st proxy '2' of the above last un-deducted proxy '3', could be subtracted ($2-2=0$) and as per rule No.4 write the second consecutive Aṅga, Druta. Till now, three Anudrutas, two Drutas and one Laghu are obtained, whose total value amounts to '11-units' and this is one-unit lesser than the value of 12-AP which is of '12-units'. So, as per rule No.6 (a), to fill-in the deficit value of the above one-unit, write one more inferior (lowest) Aṅga, Anudruta. Thus the series of aṅgas of this prastāra consists of 'U O U U I U O'.

5. What is the series of Aṅgas pertaining to the 170th prastāra of 12-AP of Khaṇḍa-jāti of Ṣaḍaṅga-prastāra? (5-12-377-170)

The respective proxies of Khaṇḍa-jāti of Ṣaḍaṅga-prastāra are the 1st, 2nd, 5th, 10th, 15th and 20th proxies and as per rule No.1 write the figures of 'Saṅkhya' upto the required permutation basing upon the above proxies (refer table-23).

As per rule No.2(a) the remainder (377-170) is '207'.

From the above remainder the first-1st proxy '220' could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first 1st-proxy.

Later, as per rule No.5(a), from the remainder '207', the first-1st proxy '129' ($207-129=78$) and the second-2nd proxy '75' ($78-75=3$) of the above un-deducted proxy '220', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Laghu, leaving away the third - 5th proxy '15'.

Now, as per rule No.5(a), from the remainder '3', the first-1st proxy '9' of the above left-off proxy '15', could not be subtracted and again the first-1st proxy '5' of the previously un-deducted proxy '9' also could not be subtracted i.e., two first-1st proxies '9 & 5' respectively of the above left-off proxy '15' and un-deducted proxy '9', could not consecutively be subtracted and as per rule No.3 write two Aṅgas, Anudrutas of the first-1st proxy consecutively.

Later, again as per rule No.5(a), from the remainder '3', the first-1st proxy '3' of the above last un-deducted proxy '5' could be subtracted ($3-3=0$) and as per rule No.4 write the second consecutive Aṅga, Druta.

Now, as per rule No.6 (a), to fill-in the deficit value of the prastāra, write two more inferior Aṅgas, Anudrutas. Thus the series of aṅgas of this prastāra consists of 'U U O U U I U'.

6. What is the series of Aṅgas pertaining to the 113th prastāra of 12-AP of Miśra-jāti of Ṣaḍaṅga-prastāra ? (7-12-271-113)

The respective proxies of Miśra-jāti of Ṣaḍaṅga-prastāra are the 1st, 2nd, 7th, 14th, 21st and 28th representing Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda respectively and as per rule No.1 write the figures of 'Saṅkhya' upto the required permutation basing upon the above proxies (refer table-29).

As per rule No.2(a) the remainder (271-113) is '158'.

From the above remainder the first-1st proxy '164' could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Now, as per rule No. 5(a), from the above remainder, the first-1st proxy '99' of the above un-deducted proxy '164', could be subtracted ($158-99=59$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the second-2nd proxy '60'.

Later, again as per rule No.5 (a), from the last remainder '59', the first-1st proxy '36' ($59-36=23$) and the second-2nd proxy '22' ($23-22=1$) of the above left-off proxy '60' could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Laghu, leaving away the third-7th proxy '2'.

Now, again as per rule No.5(a), from the last remainder '1', the first-1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'O I O U'.

7. What is the series of Aṅgas pertaining to the 2nd prastāra of 12-AP of Saṅkīrṇa-jāti of Ṣaḍaṅga-prastāra ? (9-12-243-2)

The respective proxies of Saṅkīrṇa-jāti of Ṣaḍaṅga-prastāra are the 1st, 2nd, 9th, 18th, 27th and 36th which represent the Anudruta, Druta, Laghu, Guru, Pluta, and Kākapāda respectively and as per rule No.1 write the figures of 'Saṅkhyā' upto the required permutation basing upon the above proxies (refer table-34).

As per rule No.2 (a) remainder (243-2) is '241'.

From this above remainder the first-1st proxy '149' ($241-149=92$) and the second-2nd proxy '91' ($92-91=1$) could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Laghu, leaving away the third-9th proxy '3'.

Now, as per rule No.5 (a), from the remainder '1', the first-1st proxy '2' of the above left-off proxy '3', could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first -1st proxy.

Later, again as per rule No.5(a), from the remainder '1', the first-1st proxy '1' of the above undeducted proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'O U I'.

8. What is the series of figures pertaining to the 67th prastāra of 8-UP of Saṁyuktāṅga-prastāra ? (1-8-128-67)

The respective proxies of Saṁyuktāṅga-prastāra are the figures of all the preceding houses and as per rule No.1 write the figures of 'Saṅkhyā' upto the required units of permutation basing upon all the preceding proxies (refer table-39).

As per rule No.2 (a) the remainder (128-67) is '61'.

From this above remainder the 1st proxy '64' could not be subtracted and as per rule No.3 write the Aṅga of one-unit or figure '1' of the 1st proxy.

Now, as per rule No.5 (a), from the remainder '61', the 1st proxy '32' ($61-32=29$), the 2nd proxy '16' ($29-16=13$), the 3rd proxy '8' ($13-8=5$) and the 4th proxy '4' ($5-4=1$) of the above un-deducted proxy '64' could consecutively be subtracted and as per rule No.4 write the fifth consecutive Aṅga containing five units or figure '5' leaving away the 5th proxy '2'.

Later, as per rule No.5 (a), from the remainder '1', the 1st proxy '1' of the above left-off proxy '2' could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga containing two-units or figure '2'. Thus the series of unit-values of this prastāra is '2 5 1'.

2. Akhaṇḍa-anulōma-madhyarūpa-uparisthita-naṣṭa :

9. What is the series of Aṅgas of the 6th Vilōma-prastāra of 6-DP from the prastāra of the MN ? (2-6-19-6)

As per rule No.1 write down the 'Saṅkhyā' upto the required 6-DP (refer table -1).

As 'Saṅkhyā' of 6-DP is of odd-number '19' the prastāra of the 'midmost-number (MN)' is Anulōma-10.

As per rule No.2 (a) (i) the Vilōma-serial -number '6' should be added to MN '10' ($6+10=16$) and for the odd-number of 'Saṅkhyā' figure '1' should also be subtracted from the above total '16' ($16-1=15$).

The above remainder '15' is the SF (Superior-aṅgas'-figure). As per rules of Naṣṭa this SF '15' gives out the series 'S I' of 6-DP and this is the answer.

10. What is the series of Aṅgas of the 2nd Vilōma-prastāra of 5-DP from the MN ? (2-5-10-2)

As per rule No.1 write down the 'Saṅkhyā' upto the required 5-DP (refer table-1).

As 'Saṅkhyā' of 5-DP is of even number '10' the MN is Anulōma-5.

As per rule No.2 (a) (i) the question-number '2' should be added to the MN '5' ($2+5=7$).

The above total '7' is the SF. As per Naṣṭa this figure gives out the series 'IOI' of 5-DP and this is the answer.

3. Akhaṇḍa-anulōma-madhyarūpa-adhaṣṭhita-naṣṭa :

11. What is the series of the 8th Anulōma-prastāra of 6-DP from the MN? (2-6-19-8)

As per rule No.1 write down the 'Saṅkhyā' upto the required 6-DP (refer table-1).

As 'Saṅkhyā' of 6-DP is of odd-number '19' the MN is Anulōma-10.

As per rule No.2 (a) (ii) the question-number '8' should be subtracted from the MN '10' ($10-8=2$) and for the 'Saṅkhyā' of odd-number further subtract figure '1' also from the above remainder ($2-1=1$) which is the SF. As per Naṣṭa this figure gives out the series 'IOOOO' of 6-DP and this is the answer.

12. What is the series of the 4th Anulōma-prastāra of 5-DP from the MN? (2-5-10-4)

As per rule No.1 write down the 'Saṅkhyā' upto the required 5-DP (refer table-1).

As 'Saṅkhyā' of 5-DP is of even-number '10' the MN is Anulōma-5.

As per rule No.2 (a) (ii) the question number '4' should be subtracted from the MN by which the remainder ($5-4=1$) is the SF. As per Naṣṭa this figure gives out the series 'IOOO' of 5-DP and this is the answer.

4. Akhaṇḍa-vilōma-naṣṭa :

13. What is the series of Aṅgas pertaining to the 632nd prastāra of 12-DP of Pañcāṅga-prastāra? (2-12-632-632)

As per rule No.1 write down the Saṅkhyā upto the required 12-DP (refer question-1). Now, as per rule No.2 (b) subtract figure '1' from the question number '632' ($632-1$) and the remainder is '631'. Later follow as in Akhaṇḍa-anulōma-naṣṭa.

5. Akhaṇḍa-vilōma-madhya-rūpa-uparisthita-naṣṭa :

14. What is the series of Aṅgas of the 2nd Vilōma-prastāra from the MN pertaining to the 5-DP? (2-5-10-2)

As per rule No.1 write Saṅkhyā upto the required permutation. As the respective Saṅkhyā '10' is the even number the last permutation of the first-half of the 10 permutations i.e., the 5th permutation is the MN.

As per rule No.(b) (i) subtract the question number from the MN ($5-2=3$) along with figure '1' and the last remainder is ($3-1=$) '2'.

From the above remainder '2', as the first-1st proxy '6' and again its first-1st proxy '3' could not consecutively be subtracted write two first Aṅgas i.e., two Drutas as per rule No.3 and continue the process.

Now, as per rule No. 5(a), basing upon the un-deducted last proxy '3' the process continues and accordingly, from the above remainder '2', as the first-1st proxy '2' could be subtracted ($2-2=0$) write the second Aṅga, Laghu as per rule No.4.

Later, write one Druta in the left extreme of the permutation to fill in the deficit value of the prastāra permutation as per rule No.6(c). Thus, this prastāra contains 'O I O O' in the series of Aṅgas.

6. Akhaṇḍa-vilōma-madhya-rūpa-adhaḥsthita--naṣṭa :

15. What is the series of Aṅgas of the 12th Anulōma-prastāra from the MN pertaining to the 7-DP? (2-7-33-12)

As per rule No.1 write Saṅkhyā upto the required permutation. As the respective Saṅkhyā '33' is the odd number the 17th permutation is the MN.

As per rule No.(b)(ii) add the question-number to the MN ($12+17=29$) and subtract figure '1' and the remainder is ($29-1=$) '28'.

From the above remainder '28', as the first-1st proxy '19' could be subtracted ($28-19=9$) write the second consecutive Aṅga, Laghu as per rule No.4 and leave off the second-2nd proxy '10' to continue the process.

Now, as per rule No. 5(a), basing upon the above left-off proxy '10' the process continues and accordingly, from the last remainder '9', the first-1st and second-2nd proxies could consecutively be subtracted ($9-6=3-3=0$) write the third consecutive Aṅga, Guru as per rule No.4.

Later, write one Druta in the left extreme of the permutation to fill in the deficit value of the permutation as per rule No. 6(c). Thus this prastāra contains 'O S I' in the series of Aṅgas.

B. KHAṆḌA-PRASTĀRA

7. Khaṇḍa-hīna-anulōma-naṣṭa :

16. What is the series of Aṅgas pertaining to the 12th DDP of 12-DP? (2-12-1-0-29-12)

To write the figures of 'Saṅkhyā' of Pañcāṅga-prastāra the total of the 1st, 2nd, 4th, 6th and 8th proxies should be written and for the lowest-line of Druta-mēru the total of the above proxies, except the 1st proxy, it being the lowest devoid line of the first table of Druta, should be written.

Now, as per rule No. 1 write the figures of 'Saṅkhyā' upto the required permutation (refer table -2).

As per rule No.2 (a) the remainder (29-12) is '17'.

From the above remainder, the second-2nd proxy '15' could be subtracted ($17-15=2$) and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '8'.

Now, as per rule No.5(a), from the last remainder '2', the second-2nd proxy '4' of the above left-off proxy '8', could not be subtracted and as per rule No.3 write the second consecutive Aṅga, Laghu.

Now, again as per rule No.5(a), from the last remainder '2', the second-2nd proxy '2' of the above un-deducted proxy '4', could be subtracted ($2-2=0$) and as per rule No.4 write the third consecutive Aṅga, Guru.

Later, as per rule No. 6(c), to fill-in the deficit value of the prastāra and to make it Druta-devoid-permutation (DDP) write one Laghu and thus the series of aṅgas of this prastāra consists of "ISIS".

17. What is the series of Aṅgas pertaining to the 16th DDP of 12-DP? (2-12-1-0-29-16)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder (29-16) is '13'.

From the above remainder the second-2nd proxy '15' could not be subtracted and as per rule No.3 write the second consecutive Aṅga, Laghu.

Now, as per rule No.5(a), from the above remainder '13', the second-2nd proxy '8' ($13-8=5$) and the third-4th proxy '4' ($5-4=1$) of the above un-deducted proxy '15' could consecutively be subtracted and as per rule No.4 write the fourth consecutive Aṅga, Pluta, leaving away the fourth-6th proxy '2'.

Later, again as per rule No.5 (a), from the last remainder '1', the second-2nd proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'SŠI'.

18. What is the series of Aṅgas pertaining to the 2nd LDP of 10-DP? (2-10-2-0-24-2)

To write the figures of 'Saṅkhyā' for the lowest line of Laghu-mēru, the total of all the proxies of Pañcāṅga-prastāra, except the second-2nd proxy, it being the lowest devoid line of the second table of Laghu, should be written and now, as per rule No.1 write the same upto the required permutation (refer table -3).

As per rule No.2 (a) the remainder (24-2) is '22'.

From the above remainder the first-1st proxy '16' ($22-16=6$) and the third-4th proxy '5' ($6-5=1$) could consecutively be subtracted and as per rule No.4 write the fourth consecutive Aṅga, Pluta, leaving away the fourth-6th proxy '2'.

Now, as per rule No. 5(a), from the last remainder '1', the first-1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'S Š'.

19. What is the series of Aṅgas pertaining to the 7th LDP of 10-DP? (2-10-2-0-24-7)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (24-7) is '17'.

From the above remainder the first-1st proxy '16' could be subtracted ($17-16=1$) and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '5'.

Now, as per rule No.5(a), from the last remainder '1', the first-1st proxy '3' and its first-1st proxy '2' of the above left-off proxy '5' could not consecutively be subtracted and as per rule No.3 write two Aṅgas, Drutas of the first-1st proxy.

Later, again as per rule No.5(a), from the above remainder '1', the first-1st proxy '1' of the above last un-deducted proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'S O O S'.

20. What is the series of unit-values pertaining to the 1st 1-UDP of 9-UP? (1-9-1-0-21-1)

To write 'Saṅkhya' for the Saṃyuktāṅga-prastāra the total of the figures of all the preceding houses, which are proxies, should be written and for the lowest-line of the table of one-unit the total of all the proxies, except the 1st proxy, being the lowest devoid line of the first table of one-unit, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-40)

As per the rule No.2 (a) the remainder (21-1) is '20'.

From the above remainder the 2nd proxy '8' ($20-8=12$), the 3rd proxy '5' ($12-5=7$), the 4th proxy '3' ($7-3=4$), the 5th proxy '2' ($4-2=2$), the 6th proxy '1' ($2-1=1$) and the 7th proxy '1' ($1-1=0$), thus six proxies, could consecutively be subtracted and as per rules Nos. 4 & 6 (e) as it amounts to eight houses, including the houses of the 1st proxy and the last zero, write the figure '9' of 9-units. Thus the series of this prastāra consists of '9'.

21. What is the series of unit-values of the 6th 1-UDP of 9-UP? (1-9-1-0-21-6)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-6) is '15'.

From the above remainder the 2nd proxy '8' ($15-8=7$) and the 3rd proxy '5' ($7-5=2$) could consecutively be subtracted and as per rules Nos.4 & 6 (e), as it amounts to three houses, write the figure '4' of 4-units leaving away the 4th proxy '3'.

Now, as per rule No.5 (a), from the last remainder '2', the 2nd proxy '1' ($2-1=1$) and the 3rd proxy '1' ($1-1=0$) of the above left-off proxy '3', could consecutively be subtracted and as per rules Nos.4 & 6 (e), as it amounts to four houses, write the figure '5' of 5-units. Thus the series of this prastāra consists of '5 4'.

22. What is the series of unit-values of the 12th 1-UDP of 9-UP? (1-9-1-0-21-12)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-12) is '9'.

From the above remainder the 2nd proxy '8' could be subtracted ($9-8=1$) and as per rules Nos.4 & 6 (e), as it amounts to two houses, write the figure '3' of 3-units leaving away the 3rd proxy '5'.

Now, as per rule No.5 (a), from the last remainder '1', the 2nd proxy '2' of the left-off proxy '5', could not be subtracted and as per rule No. 3 write figure '2' of the 2nd proxy.

Later, again as per rule No.5 (a), from the last remainder '1', the 2nd proxy '1' of the above un-deducted proxy '2' could be subtracted ($1-1=0$) and as per rules Nos. 4 & 6 (e) as it amounts to three houses, including the houses of zero and the omitted first-1st proxy, write figure '4' of 4-units. Thus the series of this prastāra consists of '4 2 3'.

23. What is the series of unit-values of the 19th 1-UDP of 9-UP? (1-9-1-0-21-19)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-19) is '2'.

From the above remainder the 2nd proxy '8' could not be subtracted and as per rule No.3 write figure '2' of the 2nd proxy.

Now, as per rule No.5 (a), from the above remainder '2', the 2nd proxy '3' of the above un-deducted proxy '8' could not also be subtracted and as per rule No.3 write one more figure '2' of the 2nd proxy.

Later, again as per rule No.5 (a), from the above remainder '2', the 2nd proxy '1' ($2-1=1$) and the 3rd proxy '1' ($1-1=0$) of the above un-deducted proxy '3' could consecutively be subtracted and as per rules Nos. 4 & 6 (e), as it amounts to four houses, including the houses of zero and the omitted 1st proxy, write the next consecutive figure '5' of 5-units. Thus the series of this prastāra consists of '5 2 2'.

24. What is the series of unit-values of the 18th 2-UDP of 7-UP? (1-7-2-0-21-18)

To write 'Saṅkhya' for the lowest-line of the table of '2-units' the total of all the preceding consecutive proxies, except the 2nd proxy, being the lowest devoid line of the second table of 2-units, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-41)

As per the rule No.2 (a) the remainder (21-18) is '3'.

From the above remainder three 1st proxies '12, 7 & 4' could not consecutively be subtracted and as per rule No.3 write the figure '1' three times.

Now, as per rule No.5 (a), from the above remainder '3', the 1st proxy '2' ($3-2=1$) and the 3rd proxy '1' ($1-1=0$) of the above un-deducted last proxy '4', could consecutively be subtracted and as per rules Nos.4 & 6 (e), as it amounts to three houses, including the omitted 2nd proxy, write the figure '4' of 4-units. Thus the series of this prastāra consists of '4 1 1 1'.

8. Khaṇḍa-hīna-anulōma-madhyarūpa-uparisthita-naṣṭa :

25. What is the series of Aṅgas of the 3rd Vilōma-prastāra from the MN pertaining to the DDP of 12-DP? (2-12-1-0-29-3)

As per rule No.1 write Saṅkhya upto the required permutation.

As Saṅkhyā of the DDP of 12-DP is odd-number '29' the MN is '15'.

As per rule No.2 (a) (i) add the question-number '3' to the MN '15' ($15+3=18$) and being odd-number of Saṅkhyā, further subtract figure '1' also from the above total ($18-1=17$). The remainder '17' is the SF which, as per Naṣṭa, gives out the answer-series 'I S I S'.

- 26. What is the series of Aṅgas of the 2nd Vilōma-prastāra pertaining to the DDP of 8-DP from the MN? (2-8-1-0-8-2)**

As per rule No.1 write Saṅkhyā upto the required permutation.

As Saṅkhyā of the DDP of 8-DP is of even-number '8' the MN is Anulōma-4.

As per rule No.2 (a) (i) add the question-number '2' to the MN '4' ($2+4=6$) and the total figure '6' is the SF which, as per Naṣṭa, gives out the answer-series 'I Ś'.

9. Khaṇḍa-hīna-anulōma-madhyarūpa-adhaṣṭhita-naṣṭa :

- 27. What is the series of Aṅgas of the 1st Anulōma-prastāra, from the MN, pertaining to DDP of 12-DP? (2-12-1-0-29-1)**

As per rule No.1 write Saṅkhyā upto the required permutation.

As Saṅkhyā of the DDP of 12-DP is of odd-number '29' the MN is '15'.

As per rule No.2 (a) (ii) subtract the question-number '1' from the MN '15' ($15-1=14$) and being odd-number of Saṅkhyā further subtract figure '1' also from the above remainder ($14-1=13$). The remainder '13' is the SF, which, as per Naṣṭa, gives out the answer-series 'S Ś I'.

- 28. What is the series of Aṅgas of the 3rd Anulōma-prastāra, from the MN, pertaining to the DDP of 8-DP? (2-8-1-0-8-3)**

As per rule No.1 write Saṅkhyā upto the required permutation.

As Saṅkhyā of the DDP of 8-DP is of even-number '8' the MN is Anulōma-4.

As per rule No.2 (a) (ii) subtract the question number '3' from the MN '4' ($4-3=1$). The remainder '1' is the SF, which, as per Naṣṭa, gives out the answer-series 'S I I'.

10. Khaṇḍa-hīna-vilōma-naṣṭa :

- 29. What is the series of Aṅgas of the 18th DDP of 12-DP? (2-12-1-0-29-18)**

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (b) subtract figure '1' from the question-number ($18-1=17$).

Later, follow as in Naṣṭa and obtain the answer series 'I S I S'.

11. Khaṇḍa-hīna-vilōma-madhyarūpa-uparisthita-naṣṭa :

- 30. What is the series of Aṅgas of the 2nd Vilōma-prastāra from the MN pertaining to the DDP of 8-DP? (2-8-1-0-8-2)**

As per rule No.1 write Saṅkhyā upto the required permutation. As the respective Saṅkhyā '8' is the even number the last permutation of the first-half of the 8 permutations i.e. the 4th permutation is the MN.

As per rule No. 2 (b)(i) subtract the question number from the MN ($4-2=2$) along with figure '1' and the last remainder is ($2-1=$) '1'.

From the above remainder '1' as the second 2nd-proxy '4' and again its second-2nd proxy '2' could not consecutively be subtracted write two Laghus consecutively as per rule Nos.3, 5(a), 3 and continue the process.

Later, as per rule No. 5(a), basing upon the un-deducted last proxy '2' the process starts again and accordingly, from the above remainder '1', as the second-2nd proxy '1' could be subtracted ($1-1=0$) write the third consecutive Aṅga, Guru as per rules Nos. 5(a) & 4. Thus this prastāra contains 'S II' in the series of Aṅgas.

12. Kha ḍa-hīna-vilōma-madhya-rūpa-adhaḥsthita-naṣṭa :

31. What is the series of Aṅgas of the 8th Anulōma-prastāra form the MN pertaining to the DDP of 12-DP? (2-12-1-0-29-8)

As per rule No.1 write Saṅkhyā upto the required permutation. As the respective Saṅkhyā of the DDP of 12-DP is of odd-number '29' the MN is '15'.

As per rule No.2 (b)(ii) add the question-number to the MN ($8+15=23$) and subtract figure '1' of which the remainder is ($23-1=$) '22'.

From the above remainder as the second-2nd proxy '15' could be subtracted ($22-15=7$) write the third consecutive Aṅga, Guru and leave away the third-4th proxy '8' as per rule No.4 to continue the process.

Now, as per rule No. 5(a), from the last remainder '7', as the second-2nd proxy '4', third-4th proxy '2' and fourth-6th proxy '1' could consecutively be subtracted ($7-4=3-2=1-1=0$) write the fifth consecutive Aṅga, K kapāda as per rule No.4. Thus, the series of this prastāra consists of '+S'.

13. Khaṇḍa-yukta-anulōma-naṣṭa :

32. What is the series of Aṅgas pertaining to the 2nd 2-DCP of 8-DP? (2-8-1-2-25-2)

The total of all the proxies of Pañcāṅga-prastāra, except the first-1st proxy from the immediate lower line, it being the first table of Druta should be written for the upper-lines of Druta-mēru and now as per rule No.1 write the figure of 'Saṅkhyā' upto the required permutation. (refer table-2)

As per rule No.2 (a) the remainder ($25-2$) is '23'.

From the above remainder the lower first-1st proxy '12' ($23-12=11$) and the second-2nd proxy '9' ($11-9=2$) could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '3'.

Now, as per rule No. 5 (a), from the last remainder '2', the lower first-1st proxy '2' of the above left-off proxy '3', could only be subtracted ($2-2=0$) and as per rule No.4 write the second consecutive Aṅga, Laghu.

Later, as per rule No.6 (c), to fill-in the deficit value of the prastāra and also to make it 2-DCP, two inferior Aṅgas, Drutas should be written. Thus the series of aṅgas of this prastāra consists of 'O O I S' (refer the permuted examples furnished at the end of this book).

33. What is the series of Aṅgas pertaining to the 3rd 2-DCP of 8-DP ? (2-8-1-2-25-3)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-3) is '22'.

From the above remainder the lower first-1st proxy '12' ($22-12=10$) and the second-2nd proxy '9' ($10-9=1$) could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '3'.

Later, as per rule No.5(a), from the last remainder '1', the lower first-1st proxy '2' of the above left-off proxy '3' could not be subtracted and as per rule No.3 write the first Aṅga, Druta.

Now, again as per rule No.5(a), from the last remainder '1', the lower first-1st proxy '1' of the above un-deducted proxy '2', could be subtracted and as per rule No.4 write the second consecutive Aṅga, Laghu.

Later, as per rule No.6 (c), to fill-in the deficit value of the prastāra and also to make it 2-DCP write one Druta and thus the series of aṅgas of this prastāra consists of 'O I O S'.

34. What is the series of Aṅgas pertaining to the 5th 2-DCP of 8-DP? (2-8-1-2-25-5)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (25-5) is '20'.

From the above remainder the lower first-1st proxy '12' could be subtracted ($20-12=8$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '9'.

Later, as per rule No.5 (a), from the last remainder '8' the lower first-1st proxy '5' ($8-5=3$) and the second-2nd proxy '3' ($3-3=0$) of the above left-off proxy '9', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru.

As per rule No.6 (c), to fill-in the deficit value of the prastāra and also to make it 2-DCP write two inferior Aṅgas, Drutas. Thus the series of aṅgas of this prastāra consists of 'O O S I'.

35. What is the series of Aṅgas pertaining to the 9th 2-DCP of 8-DP ? (2-8-1-2-25-9)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-9) is '16'.

From the above remainder the lower first-1st proxy '12' could be subtracted ($16-12=4$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '9'.

Now, as per rule No.5 (a), from the last remainder '4', the lower first-1st proxy '5' of the above left-of proxy '9', could not be subtracted and as per rule No.3 write the Aṅga of the first-1st proxy, Druta.

Now, again as per rule No.5 (a), from the last remainder '4', the lowest first-1st proxy '2' ($4-2=2$) and the second-2nd proxy '2' ($2-2=0$) of the above un-deducted proxy '5', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru.

As per rule No.6(c), to fill-in the deficit value of the prastāra and also to make it 2-DCP write an inferior Aṅga, Druta and thus the series of aṅgas of this prastāra consists of 'O S O I'.

36. What is the series of Aṅgas pertaining to the 12th 2-DCP of 8-DP ? (2-8-1-2-25-12)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (25-12) is '13'.

From the above remainder the lower first-1st proxy '12' could be subtracted ($13-12=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '9'.

Now, as per rule No.5(a), from the last remainder '1', the first-1st proxy '5' of the above left-off proxy '9' could not be subtracted and also again the first-1st proxy '2' of the previously un-deducted proxy '5' could not be subtracted and as per rules Nos. 3&7 (b) write two inferior Aṅgas, Drutas of the first-1st proxy.

Now, as per rules Nos.5(a) and 7(b), from the last remainder '1', the second-2nd proxy '1' of the above last un-deducted proxy '2' of the lowest-line, could be subtracted ($1-1=0$) and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'S O O I'.

37. What is the series of Aṅgas pertaining to the 15th 2-DCP of 8-DP ? (2-8-1-2-25-15)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-15) is '10'.

From this above remainder the lower first-1st proxy '12' could not be subtracted and as per rule No.3 write the Aṅga of the first-1st proxy, Druta.

Now, as per rule No. 5(a), from the above remainder '10', the lowest first-1st proxy '4' ($10-4=6$) and the second-2nd proxy '5' ($6-5=1$) of the above un-deducted proxy '12', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '2'.

Later, again as per rule No.5 (a), from the last remainder '1', the lowest first-1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Laghu.

Now, as per rule No. 6(c), to fill-in the deficit value of the prastāra and also to make it 2-DCP write an inferior Aṅga, Druta and thus the series of aṅgas of this prastāra consists of 'O I S O'.

38. What is the series of Aṅgas pertaining to the 17th 2-DCP of 8-DP ? (2-8-1-2-25-17)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-17) is '8'.

From the above remainder the lower first-1st proxy '12' could not be subtracted and as per rule No.3 write the Aṅga of the first-1st proxy, Druta.

Now, as per rule No.5 (a), from the above remainder '8', the lowest first-1st proxy '4' of the above undeducted proxy '12', could be subtracted ($8-4=4$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Later, again as per rule No.5 (a), from the last remainder '4', the lowest first-1st proxy '2' ($4-2=2$) and the second-2nd proxy '2' ($2-2=0$) of the above left-off proxy '5', could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru.

Now, as per rule No. 6(c), to fill-in the deficit value of the prastāra and also to make it 2-DCP write an inferior Aṅga, Druta and thus the series of aṅgas of this prastāra consists of 'O S I O'.

39. What is the series of Aṅgas pertaining to the 18th 2-DCP of 8-DP? (2-8-1-2-25-18)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder (25-18) is '7'.

From the above remainder the lower first-1st proxy '12' could not be subtracted and as per rule No.3 write the Aṅga of the first-1st proxy, Druta.

Now, as per rule No.5 (a), from the above remainder '7', the lowest first-1st proxy '4' of the undeducted proxy '12', could be subtracted ($7-4=3$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Later, again as per rule No.5(a), from the last remainder '3', the lowest first-1st proxy '2' of the above left-off proxy '5', could be subtracted ($3-2=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '2'.

Now, again as per rule No.5 (a), from the last remainder '1', the lowest first-1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and again as per rule No.4 write the second consecutive Aṅga, Laghu.

Later, as per rule No.6 (c), to fill in the deficit value of the prastāra and also to make it 2-DCP write an inferior Aṅga, Druta and thus the series of aṅgas of this prastāra consists of 'OIII O'.

40. What is the series of Aṅgas pertaining to the 20th 2-DCP of 8-DP ? (2-8-1-2-25-20)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder (25-20) is '5'.

From the above remainder the lower first-1st proxy '12' could not be subtracted and as per rule No.3 write the Aṅga of the first-1st proxy, Druta.

Later, as per rule No.5 (a), from the above remainder '5', the lowest first-1st proxy '4' of the above un-deducted proxy '12', could be subtracted ($5-4=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Now, again as per rule No.5(a), from the last remainder '1', the lowest first-1st proxy '2' of the above left-off proxy '5', could not be subtracted and as per rules Nos. 3 & 7 (b) write the Aṅga of the first-1st proxy, Druta.

Later, as per rules Nos. 5 (a) and 7 (b), from the last remainder '1', the lowest second-2nd proxy '1' of the above un-deducted lowest proxy '2', could be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'SOIO'.

41. What is the series of Aṅgas pertaining to the 23rd 2-DCP of 8-DP? (2-8-1-2-25-23)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-23) is '2'.

From the above remainder the lower first-1st proxy '12' and its lowest first-1st proxy '4' could not consecutively be subtracted and as per rules Nos. 3 and 7 (b) write two Aṅgas of the first-1st proxy, Drutas.

Later, as per rules Nos.5 (a) and 7 (b), from the above remainder '2', the lowest second-2nd proxy '2' of the above un-deducted last proxy '4' could be subtracted ($2-2=0$) and as per rule No.4 write the third consecutive Aṅga, Guru.

Now, as per rule No.6(c), to fill-in the deficit value of the prastāra write the inferior Aṅga, Laghu, of the lowest line. Thus the series of aṅgas of this prastāra consists of 'ISOO'.

42. What is the series of Aṅgas pertaining to the 24th 2-DCP of 8-DP ? (2-8-1-2-25-24)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2(a) the remainder (25-24) is '1'.

From the above remainder the lower first-1st proxy '12' and its lowest first-1st proxy '4' could not consecutively be subtracted and as per rules Nos.3 and 7(b) write two Aṅgas, Drutas of the first-1st proxy.

Later, as per rules Nos.5(a) and 7(b), from the above remainder '1', the lowest second-2nd proxy '2' of the above un-deducted last proxy '4', could not be subtracted again and as per rule No.4 write the Aṅga, Laghu of the same second-2nd proxy of the lowest line.

Now, again as per rules Nos.5 (a) and 7 (b), from the above remainder '1', the second-2nd proxy '1' of the above un-deducted lowest proxy '2' could , now, be subtracted ($1-1=0$) and as per rule No.4 write the third consecutive Aṅga, Guru. Thus the series of aṅgas of this prastāra consists of 'SIOO'.

43. What is the series of Aṅgas pertaining to the 3rd 1-LCP of 8-DP? (2-8-2-1-21-3)

To write the 'Saṅkhya' for the upper-lines of Laghu-mēru, the total of all the proxies of Pañcāṅga-prastāra, except the second-2nd proxy, it being the second table of Laghu, from the immediate lower line, should be written and now, as per rule No.1 write the same upto the required permutation (refer table-3).

As per rule No.2 (a) the remainder (21-3) is '18'.

From the above remainder the first-1st proxy '12' ($18-12=6$) and the lowest second-2nd proxy '5' ($6-5=1$) could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the third-4th proxy '3'.

Later, as per rule No.5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '3', could not be subtracted and as per rule No. 3 write the Aṅga of the first-1st proxy which is Druta.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above undeducted proxy '2', could be subtracted ($1-1=0$) and per rule No.4 write the second consecutive Aṅga, Laghu.

Later, as per rule No.6 (b), to fill-in the deficit value of the prastāra write an inferior Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'OIOS' (refer the permuted examples furnished at the end of this book).

44. What is the series of Aṅgas pertaining to the 8th 1-LCP of 8-DP? (2-8-2-1-21-8)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-8) is '13'.

From the above remainder the first-1st proxy '12' could be subtracted ($13-12=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the lowest second-2nd proxy '5'.

Now, as per rules Nos.5 (a) 7 (a), from the last remainder '1', the first-1st proxy '3' and again its first-1st proxy '2' of the above left-off proxy '5', could not consecutively be subtracted and as per rule No.3 write two Aṅgas, Drutas of the first-1st proxy.

Later, again as per rule No. 5(a), from the last remainder '1', the first-1st proxy '1' of the above undeducted last proxy '2', could be subtracted ($1-1=0$) and as per rules Nos. 4 & 7 (a) write the Aṅga, Guru of the third consecutive proxy, as the second consecutive Aṅga, Laghu should not be written, being the lowest devoid line of Laghu-māru. Thus the series of aṅgas of aṅgas of this prastāra consists of 'SOOI'.

45. What is the series of Aṅgas pertaining to the 13th 1-LCP of 8-DP? (2-8-2-1-21-13)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-13) is '8'.

From the above remainder the first-1st proxy '12' could not be subtracted and as per rule No.3 write the Aṅga, Druta of the first-1st proxy.

Later, as per rule No.5 (a), from the above remainder '8', the first-1st proxy '7' of the above undeducted proxy '12', could be subtracted ($8-7=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the lowest second-2nd proxy '3'.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '3', could not be subtracted and as per rule No.3 write the Aṅga, Pluta of the first-1st proxy.

Later, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the undeducted proxy '2', could be subtracted ($1-1=0$) and as per rules Nos.4 & 7 (a) write the third consecutive Aṅga, Guru, as the second consecutive Aṅga, Laghu, should not be written, being the lowest devoid line of Laghu. Thus the series of aṅgas of this prastāra consists of 'S O I O'.

46. What is the series of Aṅgas pertaining to the 18th 1-LCP of 8-DP? (2-8-2-1-21-18)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (21-18) is '3'.

From the above remainder the first-1st proxy '12', its first-1st proxy '7' and again its first-1st proxy '4' thus three first-1st proxies could not consecutively be subtracted and as per rule No.3 write three Aṅgas, Drutas of the first-1st proxy.

Later, as per rule No. 5(a), from the above remainder '3', the first-1st proxy '3' of the above un-deducted last proxy '4', could be subtracted ($3-3=0$) and as per rule No.4 write the second consecutive Aṅga, Laghu.

Now, as per rule No.6 (b), to fill-in the deficit value of the prastāra write three inferior Aṅgas, Drutas. Thus the series of aṅgas of this prastāra consists of 'O O O 1 O O O'.

47. What is the series of Aṅgas pertaining to the 4th 1-GCP of 8-DP ? (2-8-4-1-20-4)

To write the figures of 'Saṅkhya' for the upper lines of Guru-mēru, the total of all the proxies of Pañcāṅga-prastāra, except the third-4th proxy, being the third table of Guru, of the immediate lower line, should be written and now, as per rule No.1 write the same up to the required permutation. (refer table-4).

As per rule No. 2(a) the remainder (20-4) is '16'.

From the above remainder the first-1st proxy '10' ($16-10=6$) and the second-2nd proxy '5' ($6-5=1$) could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Guru, leaving away the lowest third-4th proxy '5'.

Now, as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '3' and again its first-1st proxy '2' of the above left-off proxy '5' could not consecutively be subtracted and as per rule No.3 write two Aṅgas, Drutas of the first-1st proxy.

Later, again as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted last proxy '2' could be subtracted ($1-1=0$) and as per rule No. 4 write the second consecutive Aṅga, Laghu. Thus the series of aṅgas of this prastāra consists of 'I O O S'.

48. What is the series of Aṅgas pertaining to the 9th 1-GCP of 8-DP ? (2-8-4-1-20-9)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (20-0) is '11'.

From the above remainder, the first-1st proxy '10' could be subtracted ($11-10=1$) and as per rule No.4, write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Now, as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '5', could not be subtracted and as per rule No. 3 write the Aṅga, Druta of the first-1st proxy.

Later, again as per rule No. 5(a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '2' could, now, be subtracted and as per rules Nos. 4, 5 (b) & (c) write Guru as it should be 1-GCP.

Now, as per rule No. 6 (b), to fill - in the deficit value of the prastāra write one Druta and thus the series of aṅgas of this prastāra consists of 'O S O I'.

49. What is the series of Aṅgas pertaining to the 5th 1-PCP of 10-DP ? (2-10-6-1-22-5)

To write the figures of 'Saṅkhya' for the upper-lines of Pluta-mēru, the total of all the proxies of Pañcāṅga-prastāra, except the fourth-6th proxy, being the fourth table of Pluta, of the immediate lower line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-5)

As per rule No. 2(a) the remainder (22-5) is '17'.

From the above remainder, the first-1st proxy '10' ($17-10=7$), the second-2nd proxy '5' ($7-5=2$) and the third-4th proxy '1' ($2-1=1$) could consecutively be subtracted and as per rule No.4 write the fourth consecutive Aṅga, Pluta, leaving away the lowest fourth-6th proxy '6'.

Later, as per rule No.5 (a), from the last remainder '1', the first-1st proxy '3' and again the first-1st proxy '2' of the above left-of proxy '6' could not consecutively be subtracted and as per rules Nos.3 & 7(a) write two Aṅgas, Drutas of the first-1st proxy.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted last proxy '2', could be subtracted ($1-1=0$) and as per rules Nos.4 & 7(a) write the second consecutive Aṅga, Laghu. Thus the series of aṅgas of this prastāra consists of 'I O O Ś'.

50. What is the series of Aṅgas pertaining to the 11th 1-PCP of 10-DP? (2-10-6-1-22-11)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (22-11) is '11'.

From the above remainder the first-1st proxy '10' could be subtracted ($11-10=1$) and as per rule No.4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Now, as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '5' could not be subtracted and as per rule No.3 write the Aṅga, Druta of the first - 1st proxy.

Later, again as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '2', could be subtracted ($1-1=0$) and as per rules Nos.4,5 (b) & (c) write Pluta as it should be 1-PCP.

Later, as per rule No. 6 (b), to fill-in the deficit value of the prastāra write one Druta and thus the series of aṅgas of this prastāra consists of 'O Ś O I'.

51. What is the series of Aṅgas pertaining to the 5th 1-KCP of 12-DP ? (2-12-8-1-22-5)

To write the figures of 'Saṅkhya' for the upper-lines of Kākapāda-mēru, the total of all the proxies of Pañcāṅga-prastāra, except the fifth-8th proxy, being the fifth table of Kākapāda, of the immediate lower line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table -6)

As per rule No.2 (a) the remainder (22-5) is '17'.

From the above remainder the first-1st proxy '10' ($17-10=7$), the second-2nd proxy '5' ($7-5=2$) and the third-4th proxy '1' ($2-1=1$) could consecutively be subtracted and as per rules Nos.4, 5 (b) & (c) write Kākapāda as it should be a 1-KCP and leave away the lowest fifth-8th proxy '6'.

Later, as per rule No.5 (a), from the last remainder '1', the first-1st proxy '3' and again its first-1st proxy '2' of the above left-off proxy '6' could not consecutively be subtracted and as per rules Nos.3 & 7 (a) write two Aṅgas, Drutas of the first-1st proxy.

Now, again as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted last proxy '2' could be subtracted ($1-1=0$) and as per rules Nos.4 & 7 (a) write the second consecutive Aṅga, Laghu. Thus the series of aṅgas of this prastāra consists of 'I O O +'.

52. What is the series of Aṅgas pertaining to the 11th 1-KCP of 12-DP? (2-12-8-1-22-11)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (22-11) is '11'.

From the above remainder the first-1st proxy '10' could be subtracted ($11-10=1$) and as per rule No. 4 write the second consecutive Aṅga, Laghu, leaving away the second-2nd proxy '5'.

Later, as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '5' could not be subtracted and as per rule No.3 write the Aṅga, Druta of the first-1st proxy.

Now, again as per rule No. 5(a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '1' could be subtracted ($1-1=0$) and as per rules Nos. 5 (b) & (c) write Kākapāda as it should be a 1-KCP.

Later, as per rule No. 6(b), to fill-in the deficit value of the prastāra write one Druta. Thus the series of aṅgas of this prastāra consists of 'O + O 1'.

53. What is the series of Aṅgas pertaining to the 17th 1-GCP of 10-AP of Trisra-jāti ? (3-10-6-1-26-17)

To write 'Saṅkhya' for the upper-lines of Guru-mēru pertaining to Trisra-jāti of Ṣaḍaṅga-prastāra, the total of all the 1st, 2nd, 3rd, 9th and 12th proxies, except the fourth-6th proxy, being the fourth table of Guru, of the immediate lower-line should be written and now, as per rule No. 1 write the figures upto the required permutation. (refer table-12)

As per rule No. 2(a) the remainder (26-17) is '9'.

From the above remainder, the first-1st proxy '12', could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Later, as per rule No. 5 (a), from the above remainder '9', the first-1st proxy '5' ($9-5=4$), the second-2nd proxy '2' ($4-2=2$) and the third-3rd proxy '1' ($2-1=1$) of the above un-deducted proxy '12', could consecutively be subtracted and as per rule No. 4 write the fourth consecutive Aṅga, Guru, leaving away the lowest fourth-6th proxy '4'.

Now, as per rules Nos.7(a) & 5(a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '4', could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Later as per rule No. 5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '2' could be subtracted and as per rule No.4 write the second consecutive Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'O U S U'.

54. What is the series of Aṅgas pertaining to the 16th 1-LCP of 8-AP of Caturaśra-jāti? (4-8-4-1-20-16)

To write 'Saṅkhyā' for the upper-lines of Laghu-mēru pertaining to Caturaśra-jāti of Ṣaḍaṅga-prastāra, the total of all the 1st, 2nd, 8th, 12th and 16th proxies, except the third-4th proxy, being the third table of Laghu, of the immediate lower line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-19)

As per rule No.2(a) the remainder (20-16) is '4'.

From the above remainder the first-1st proxy '10' and again its first-1st proxy '5' could not consecutively be subtracted and as per rule No. 3 write two Aṅgas, Anudrutas of the first-1st proxy.

Later, as per rule No.5 (a), from the above remainder '4', the first-1st proxy '2' ($4-2=2$) and the second-2nd proxy '1' ($2-1=1$) of the above un-deducted last proxy '5', could consecutively be subtracted and as per rule No.4, write the third consecutive Aṅga, Laghu, leaving away the lowest third-4th proxy '2'.

Now, as per rules Nos.7 (a) & 5(a) from the last remainder '1', the first-1st proxy '1' of the above left-off proxy '2' could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta. Thus the series of aṅgas of this prastāra consists of 'O I U U'.

55. What is the series of Aṅgas pertaining to the 8th 1-DCP of 10-AP of Khaṇḍa-jāti ? (5-10-2-1-29-8)

To write 'Saṅkhyā' for the upper-lines of Druta-mēru of Khaṇḍa-jāti of Ṣaḍaṅga-prastāra, the total of all the 1st, 5th, 10th, 15th and 20th proxies, except the second-2nd proxy, being the second table of Druta, of the immediate lower-line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-25)

As per rule No.2 (a) the remainder (29-8) is '21'.

From the above remainder the first-1st proxy '20' could be subtracted ($21-20=1$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the lowest second-2nd proxy '5'.

Now, as per rules Nos.7 (a) & 5 (a), from the last remainder '1' the first-1st proxy '4' of the above left-off proxy '5', its first-1st proxy '3' and again its first-1st proxy '2', thus three first-1st proxies, could not consecutively be subtracted and as per rule No.3 write three Aṅgas, Anudrutas of the first-1st proxy.

Later, as per rules Nos.5 (a) & 7 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted last proxy '2' could be subtracted ($1-1=0$) and as per rule No. 4 write the third consecutive Aṅga, Laghu, as in this table of Druta the Druta and its second-2nd proxy are omitted for the lowest-line being the line of DDPs. Thus the series of aṅgas of this prastāra consists of 'I U U U O'.

56. What is the series of Aṅgas pertaining to the 11th 1-DCP of 12-AP of Miśra-jāti ? (7-12-2-1-31-11)

To write 'Saṅkhyā' for the upper-lines of Druta-mēru of Miśra-jāti of Ṣaḍaṅga-prastāra, the total of all the 1st, 7th, 14th, 21st and 28th proxies, except the second-2nd proxy, being the

second table of Druta, of the immediate lower-line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-31).

As per the rule No.1 (a) the remainder (31-11) is '20'.

From the above remainder the first-1st proxy '22' could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Now, as per rule No.5 (a), from the above remainder '20', the first-1st proxy '15' ($20-15=5$) and the second-2nd proxy '4' ($5-4=1$) of the above undeducted proxy '22' could consecutively be subtracted and as per rule No.4 write the third consecutive Aṅga, Laghu, leaving away the third-7th proxy '3'.

Later, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '2' of the above left-off proxy '3', could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '2' could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta.

Later, as per rule No.6 (b), write the lowest Aṅga, Anudruta to fill-in the deficit value of the prastāra. Thus the series of aṅgas of this prastāra consists of 'UOUIU'.

57. What is the series of Aṅgas pertaining to the 10th 5-ACP of 9-AP of Saṅkīrṇa-jāti? (9-9-1-5-21-10)

To write 'Saṅkhyā' for the upper-lines of Anudruta-mēru of Saṅkīrṇa-jāti of Ṣaḍaṅga-prastāra, the total of all the 2nd, 9th, 18th, 27th and 36th, except the first-1st proxy, being the first table of Anudruta, of the immediate lower-line, should be written and now, as per rule No.1 write the same upto the required permutation. (refer table-35)

As per the rule No.2 (a) the remainder (21-10) is '11'.

From the above remainder the first-1st proxy '15' could not be subtracted and as per rule No.3 write the Aṅga, Anudruta of the first-1st proxy.

Later, again as per rule No.5 (a), from the above remainder '11', the first-1st proxy '10' of the above un-deducted proxy '15', could be subtracted ($11-10=1$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the second-2nd proxy '5'.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '4' of the above left-off proxy '5' its first-1st proxy '3' and again its first-1st proxy '2', thus three first-1st proxies, could not consecutively be subtracted and as per the rule No.3 write three Aṅgas, Anudrutās of the first-1st proxy.

Later, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted last proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta.

Now, as per rule No.6 (d), write an Anudruta, the lowest Aṅga, to fill-in the deficit value of the prastāra and also as it should be a 5-ACP. Thus the series of aṅgas of this prastāra consists of 'UOUUUOU'.

58. What is the series of Aṅgas pertaining to the 17th 5-ACP of 9-AP of Saṅkīrṇa-jāti? (9-9-1-5-21-17)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder (21-17) is '4'.

From the above remainder the first-1st proxy '15', its first-1st proxy '10' and again its first-1st proxy '6', thus three first-1st proxies, could not consecutively be subtracted and as per rule No.3 write three Aṅgas, Anudrutās of the first-1st proxy.

Later, again as per rule No.5 (a), from the above remainder '4', the first-1st proxy '3' of the above un-deducted last proxy '6', could be subtracted ($4-3=1$) and as per rule No.4 write the second consecutive Aṅga, Druta, leaving away the second-2nd proxy '3'.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above left-off proxy '3', could not be subtracted and as per rule No.3 write the Aṅga, Anudrutā of the first-1st proxy.

Now, again as per rule No.5 (a), from the last remainder '1', the first-1st proxy '1' of the above un-deducted proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the second consecutive Aṅga, Druta.

Later, again as per rule No.6 (d), write an Anudrutā, the lowest Aṅga, to fill-in the deficit value of the prastāra and also as it should be a 5-ACP. Thus the series of aṅgas of this prastāra consists of 'UOUOUUU'.

59. What is the series of unit-values of the 7th 1-UCP of 8-UP? (1-8-1-1-26-7)

To write 'Saṅkhyā' for the upper-lines of the table of '1-unit' the total of all the preceding consecutive proxies, except the 1st proxy, being the first table of one-unit, of the immediate lower-line, should be written and as per rule No.1 write the same upto the required permutation. (refer table-40)

As per the rule No.2 (a) the remainder (26-7) is '19'.

From the above remainder the lowest 1st proxy '8' ($19-8=11$) and the 2nd proxy '8' ($11-8=3$) could consecutively be subtracted and as per rule No.4 write the next consecutive figure '3' leaving away the 3rd proxy '5'.

Now, as per rule No.5 (a), from the last remainder '3', the lowest 1st proxy '2' of the above left-off proxy '5' could be subtracted ($3-2=1$) and as per rule No.4 write the next consecutive figure '2' leaving away the 2nd proxy '2'.

Later, again as per rule No.5 (a), from the last remainder '1', the lowest 1st proxy '1' of the above left-off proxy '2', could be subtracted ($1-1=0$) and as per rule No.4 write the next consecutive figure '2'.

Now, as per rule No.6 (e) write figure '1' to fill in the deficit value of the prastāra. Thus the series of aṅgas of this prastāra consists of '1 2 2 3' (refer the permuted examples furnished at the end of this book).

60. What is the series of unit-values of the 9th 1-UCP of 8-UP? (1-8-1-1-26-9)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder (26-9) is '17'.

From the above remainder the lowest 1st proxy '8' ($17-8=9$) and the 2nd proxy '8' ($9-8=1$) could consecutively be subtracted and as per rule No.4 write the 3rd consecutive figure '3' leaving away the 3rd proxy '5'.

Now, as per rule No.5 (a), from the last remainder '1', the lowest 1st proxy '2' of the above left-off proxy '5' could not be subtracted and as per rule No. 7 (b) write the figure '1' of the 1st proxy.

Later, again as per rules Nos. 7 (b) & 5 (a), from the last remainder '1', the 2nd proxy '1' of the above undeducted proxy '2' could be subtracted ($1-1=0$) and as per rules Nos. 4 & 6 (e), as it amounts to three houses, including the zero and 1st proxy, write the figure '4' of 4-units. Thus the series of this prastāra consists of '4 1 3'.

61. What is the series of unit-values of the 11th 1-UCP of 8-UP? (1-8-1-1-26-11)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (26-11) is '15'.

From the above remainder the lowest 1st proxy '8' could be subtracted ($15-8=7$) and as per rule No.4 write the figure '2' leaving away the 2nd proxy '8'.

Now, as per rule No.5 (a), from the above remainder '7', the lowest 1st proxy '3' ($7-3=4$), the 2nd proxy '2' ($4-2=2$) and the 3rd proxy '2' ($2-2=0$) of the above left-off proxy '8' could consecutively be subtracted and as per rules Nos. 4 & 6 (e), as it amounts to four houses, including the house of zero, write the figure '5' of 5-units.

Later, as per rule No. 6 (e) write the figure '1' to fill-in the deficit value of the prastāra. Thus the series of this prastāra consists of '1 5 2'.

62. What is the series of unit-values of the 14th 1-UCP of 8-UP? (1-8-1-1-26-14)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (26-14) is '12'.

From the above remainder the lowest 1st proxy '8' could be subtracted ($12-8=4$) and as per rule No.4 write the figure '2' leaving away the 2nd proxy '8'.

Now, as per rule No.5 (a), from the last remainder '4', the lowest 1st proxy '3' of the above left-off proxy '8' could be subtracted ($4-3=1$) and as per rule No. 4 write the figure '2', leaving away the 2nd proxy '2'.

Again, as per rule No.5 (a), from the last remainder '1', the lowest 1st proxy '1' of the above left-off proxy '2' could be subtracted ($1-1=0$) and now, as per rules Nos. 4 & 6 (e), as it amounts to two houses, including the house of zero, write the figure '3' of 3-units.

Later, as per rule No.6 (e) write the figure '1' to fill-in the deficit value of the prastāra. Thus the series of this prastāra consists of '1 3 2 2'.

63. What is the series of unit-values of the 16th 1-UCP of 8-UP? (1-8-1-1-26-16)

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (a) the remainder (26-16) is '10'.

From the above remainder the lowest 1st proxy '8' could be subtracted ($10-8=2$) and as per rule No.4 write the figure '2' leaving away the 2nd proxy '8'.

Now, as per rule No.5 (a), from the last remainder '2', the lowest 1st proxy '3' of the above left-off proxy '8' could not be subtracted and as per rule No.7 (b) write the figure '1'.

Later, again as per rules Nos. 7 (b) & 5 (a), from the last remainder '2', the 2nd proxy '1' ($2-1=1$) and the 3rd proxy '1' ($1-1=0$) of the above un-deducted proxy '3' could consecutively be subtracted and as per rules Nos. 4 & 6 (e), as it amounts to four houses, including the houses of zero and the omitted 1st proxy, write the figure '5' of 5-units. Thus the series of this prastāra consists of '5 1 2'.

64. What is the series of unit-values of the 12th 1-2-UCP of 7-UP? (1-7-2-1-26-12)

To write 'Saṅkhyā' for the upper-lines of the table of '2-units' the total of all the preceding consecutive proxies, except the 2nd proxy, being the second table of 2-units, of the immediate lower-line, should be written and as per rule No.1 write the same upto the required permutation. (refer table-41)

As per the rule No.2 (a) the remainder ($26-12$) is '14'.

From the above remainder the 1st proxy '13' could be subtracted ($14-13=1$) and as per rule No.4 write the figure '2' leaving away the 2nd proxy '7'.

Now, as per rules Nos.7(a) & 5 (a), from the last remainder '1', two 1st proxies '4 & 2' of the above left-off proxy '7', could not consecutively be subtracted and as per rule No.3 write the figure '1' two times.

Later, as per rule No. 5(a), from the last remainder '1', the 1st proxy '1' of the above un-deducted last proxy '2', could be subtracted ($1-1=0$) and as per rule No.4, figure '2' has to be written. But, as it is contrary to write more than one figure of 2-units, being a single-figure containing permutation of 2-units, as per rules Nos.5(c) & 6(e), instead of writing figure '2' of 2-units, figure '3' of 3-units should only be written. Thus the series of this prastāra consists of '3 1 1 2'.

65. What is the series of unit-values pertaining to the 17th 1-2-UCP of 7-UP? (1-7-2-1-26-17)

As per rule No.1 write Saṅkhyā upto the required permutation.

As per rule No.2 (a) the remainder ($26-17$) is '9'.

From the above remainder the lowest 1st proxy '13' could not be subtracted and as per rule No.3 write the figure '1' of the 1st proxy.

Later, as per rule No. 5 (a), from the above remainder '9', the 1st proxy '6' of the above un-deducted proxy '13' could be subtracted ($9-6=3$) and as per rule No.4 write the figure '2' leaving away the lowest 2nd proxy '4'.

Now, as per rule Nos. 7 (a) & 5(a), from the last remainder '3', the 1st proxy '2' ($3-2=1$) and the 3rd proxy '1' ($1-1=0$) of the above left-off proxy '4' could consecutively be subtracted and as per rules Nos. 4 & 6 (e), as it amounts to '3' houses, including the omitted 2nd proxy, write the figure '4' of 4-units. Thus the series of this prastāra consists of '4 2 1'.

14. Khaṇḍa-yukta-anulōma-madhyarūpa-uparisthita-naṣṭa :

- 66. What is the series of Aṅgas of the 4th Vilōma prastāra, from the MN, pertaining to the 2-DCP of 8-DP? (2-8-1-2-25-4)**

As per rule No.1 write Saṅkhya upto the required permutation.

As Saṅkhya of the 2-DCP of 8-DP is of odd-number '25' the MN is '13'.

As per rule No.2 (a) (i) add the question-number '4' to the MN '13' ($13+4=17$) and being the odd-number of Saṅkhya, further subtract figure '1' also from the above total ($17-1=16$). The remainder '16' is the SF which, as per Naṣṭa, gives out the answer-series 'O S O I'.

- 67. What is the series of Aṅgas of the 7th Vilōma-prastāra, from the MN, pertaining to the 1-DCP of 9-DP? (2-9-1-1-28-7)**

As per rule No.1 write Saṅkhya upto the required permutation.

As Saṅkhya of the 1-DCP of 9-DP is of even-number '28' the MN is Anulōma-14.

As per rule No.2 (a) (i) add the question-number '7' to the MN '14' ($14+7=21$). This total '21' is the SF, which, as per Naṣṭa, gives out the answer-series 'S O S'.

15. Khaṇḍa-yukta-anulōma-madhyarūpa-adhaṣṭhita-naṣṭa :

- 68. What is the series of Aṅgas of the 7th Anulōma-prastāra, from the MN, pertaining to 2-DCP of 8-DP? (2-8-1-2-25-7)**

As per rule No.1 write Saṅkhya upto the required permutation.

As Saṅkhya of the 2-DCP of 8-DP is of odd-number '25' the MN is '13'.

As per rule No.2 (a) (ii) subtract the question-number '7' from the MN '13' ($13-7=6$) and being odd-number of Saṅkhya further subtract figure '1' also from the above remainder ($6-1=5$). The remainder '5' is the SF, which, as per Naṣṭa, gives out the answer-series 'S O I O'.

- 69. What is the series of Aṅgas of the 9th Anulōma-prastāra, from the MN, pertaining to 1-DCP of 9-DP? (2-9-1-1-28-9)**

As per rule No.1 write Saṅkhya upto the required permutation.

As Saṅkhya of the 1-DCP of 9-DP is of even-number '28' the MN is '14'.

As per rule No.2 (a) (ii) subtract the question-number '9' from the MN '14' ($14-9=5$). The remainder '5' is the SF, which, as per Naṣṭa, gives out the answer series 'S S O'.

16. Khaṇḍa-yukta-vilōma-naṣṭa :

- 70. What is the series of Aṅgas of the 21st 2-DCP of 8-DP? (2-8-1-2-25-21)**

As per rule No.1 write Saṅkhya upto the required permutation.

As per rule No.2 (b) subtract figure '1' from the question-number ($21-1=20$).

Later, follow as in Naṣṭa and obtain the answer series 'O O S I'.

17. Khaṇḍa-yukta-vilōma-madhyarūpa-uparisthita-naṣṭa :

71. What is the series of Aṅgas of the 9th Vilōma-prastāra from the MN pertaining to the 2-DCP of 8-DP? (2-8-1-2-25-9)

As per rule No.1 write Saṅkhya upto the required permutation. As the respective Saṅkhya of the 2-DCP of 12-DP is of odd-number '25' the MN is '13'.

As per rule No. 2(b)(i) subtract the question number from the MN ($13-9=4$) along with figure '1' and the last remainder is ($4-1=$) '3'.

From the above remainder, as the first-1st proxy '12' and again its first-1st proxy '4' could not be subtracted write two Drutas of the 1st proxy as per rules Nos. 3, 5(a), 7(b) & 3 to continue the process.

Now, as per rule No. 5(a) & 7(b), from the above remainder, as the second-2nd proxy '2' and the third -4th proxy '1' could consecutively be subtracted ($3-2=1-1=0$) write the fourth consecutive Aṅga, Pluta as per rule No.4. Thus the series of Aṅgas of this prastāra consists of 'Ṣ O O'.

18. Khaṇḍa-yukta-vilōma-madhyarūpa-adhaṣṭhita-naṣṭa :

72. What is the series of Aṅgas of the 11th Anulōma-prastāra from the MN pertaining to the 1-DCP of 9-DP? (2-9-1-1-28-11)

As per rule No.1 write Saṅkhya upto the required permutation. As the respective Saṅkhya '28' is the even number the last permutation of the first half of the 28 permutations i.e., the 14th permutation is the MN.

As per rule No. 2 (b) (ii) add the question number to the MN ($14+11=25$) and subtract figure '1' and the remainder is ($25-1=$) '24'.

From the above remainder '24' as the first-1st and second-2nd proxies could consecutively be subtracted ($24-8=16-12=4$) write the third consecutive Aṅga, Guru and leave off its third-4th proxy '5' as per rule No.4 to continue the process.

Later, as per rule No.5(a), basing upon the above left-off proxy '5' the process starts again and accordingly, from the last remainder '4', again the first-1st and second-2nd proxies could consecutively be subtracted ($4-2=2-2=0$) write the third consecutive Aṅga, Guru as per rule No.4.

Now, write one Druta in the left extreme of the permutation to fill in the deficit value of the permutation and also to make it 1-DCP as per rule No.6(c). Thus, this prastāra contains 'O S S' in the series of Aṅgas.

4.2. UDDIṢṬA

Uddiṣṭa is the easy method to obtain the serial number of any prastāra in question containing a particular series of Aṅgas, basing upon the figures of Saṅkhya and also applying the same rules governing 'Naṣṭa'.

Note : For Uddiṣṭa the following rule could also be applied.

As per the rules of Naṣṭa the total of the successfully subtracted proxies should be subtracted from "Saṅkhya" and the remainder is the answer of Uddiṣṭa.

As per rules governing 'Naṣṭa' the un-deducted proxies always originate the inferior (least) Aṅgas and the deducted proxies always originate the superior Aṅgas. In a question-series of Aṅgas of a

prastāra the total of the proxies which are successfully subtracted and originated superior Aṅgas is the superiors'-figure (SF).

- (a) Anulōma-uddiṣṭa : Subtract the SF from the Saṅkhya and the remainder is the answer-serial-number.
- (i) Anulōma-madhyarūpa-uparisthita-uddiṣṭa : Subtract the MN from the SF and for the odd-number of Saṅkhya further add figure '1' and the last figure is the answer-serial-number.
- (ii) Anulōma-madhyarūpa-adhaṣṭhita-uddiṣṭa : Subtract the SF from the MN and for the odd-numbers of Saṅkhya further subtract figure '1' also and the last figure is the answer-serial-number.
- (b) Vilōma-uddiṣṭa : Add figure '1' to the SF and the total is the answer-serial-number.
- (i) Vilōma-madhyarūpa-uparisthita-uddiṣṭa : Subtract the SF from the MN and subtract figure '1' also and the last remainder is the answer-serial-number.
- (ii) Vilōma-madhyarūpa-adhaṣṭhita-uddiṣṭa : Subtract the MN from the SF and add figure '1' and the last figure is the answer-serial-number.

A. AKHAṆḌA-PRASTĀRA

1. Akhaṇḍa-anulōma-uddiṣṭa:

1. What is the serial number of the 12-DP containing 'I O Ś O I' in the series of Aṅgas ?
(2-12-632-I O Ś O I)

Write the figures of Saṅkhya upto the required permutation (refer table-1).

I	O	Ś	O	I
1	(2)	61	(108)	350
		33		[196]
		10		
		[3]		

Note : In the above figures mentioned just below the Aṅgas the un-deducted proxies, from which the inferior Aṅgas, Drutas are originated, are shown in small brackets and the proxies, which are left-off after obtaining the superior Aṅgas, are shown in big brackets and the proxies, which are successfully subtracted and originated superior Aṅgas are shown without any signs.

SF of the question-series is $(350+61+33+10+1=)$ '455' and as per rule No. (a) the answer-serial-number is $(632-455=)$ '177'.

2. What is the serial number of 12-AP of Trisra-jāti containing 'S I O U' in the series of Aṅgas? (3-12-1059-S I O U)

As per rule No. 1 of Naṣṭa write Saṅkhya upto the required permutation. (refer table-8).

S	I	O	U
13	86	302	(565)
7	46	[162]	
4	[25]		

SF of the question-series is $(302+88+46+13+7+4=)$ '458' and as per rule No. (a) the answer-serial-number is $(1059-458=)$ '601'.

3. **What is serial number of 12-AP of Caturāsra-jāti containing 'I O I O' in the series of Aṅgas? (4-12-543-I O I O)**

As per rule No. 1 of Naṣṭa write Saṅkhyā upto the required permutation. (refer table-16)

I	O	I	O
3	10	98	306
2	[6]	56	[174]
		[18]	

SF of the question-series is $(306+98+56+10+3+2=)$ '475' and as per rule No. (a) the answer-serial-number is $(543-475=)$ '68'.

4. **What is the serial number of 12-AP of Khaṇḍa-jāti containing 'U I I U' in the series of Aṅgas? (5-12-377-U I I U)**

As per rule No. 1 of Naṣṭa write Saṅkhyā upto the required permutation. (refer table-23).

U	I	I	U
	9	129	(220)
	5	75	
		[15]	

SF of the question-series is $(129+75+9+5=)$ '218' and as per rule No. (a) the answer-serial-number is $(377-218=)$ '159'.

5. **What is the serial number of 12-AP of Miśra-jāti containing 'U O U U O U U O U' in the series of Aṅgas ? (7-12-271-U O U U O U U O U)**

As per rule No. 1 of Naṣṭa write Saṅkhyā upto the required permutation. (refer table-29).

U	O	U	U	O	U	U	O	U
	2	(3)	(5)	13	(22)	(36)	99	(164)
				[8]			[60]	

SF of the question-series is $(99+13+2=)$ '114' and as per rule No. (a) the answer-serial-number is $(271-114=)$ '157'.

6. **What is the serial number of 12-AP of Saṅkīrṇa-jāti containing 'O U O U O U O U' in the series of Aṅgas? (9-12-243-O U O U O U O U)**

As per rule No. 1 of Naṣṭa write Saṅkhyā upto the required permutation. (refer table-34)

O	U	O	U	O	U	O	U
1	(2)	5	(8)	21	(34)	91	(149)
		[3]		[13]		[56]	

SF of the question-series is $(91+21+5+1=)$ '118' and as per rule No. (a) the answer-serial-number is $(243-118=)$ '125'.

7. **What is the serial number of 12-UP containing '2 1 1 2 1 1 2 1 1' in the series of Aṅgas? (1-12-2048-2 1 1 2 1 1 2 1 1)**

As per rule No. 1 of Naṣṭa write Saṅkhyā upto the required permutation. (refer table-39).

2	1	1	2	1	1	2	1	1
1	(2)	(4)	16	(32)	(64)	256	(512)	(1024)
			[8]			[128]		

SF of the question-series is $(256+16+1)= '273'$ and as per rule No. (a) the answer-serial-number is $(2048-273)= '1775'$.

2. Akhaṇḍa-anulōma-madhyarūpa-uparisthita-uddiṣṭa :

8. **What is the Vilōma-serial-number of the series 'S I' of 6-DP from the MN? (2-6-19-S I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

As Saṅkhyā of 6-DP is of odd-number '19' the MN is '10'.

S	I
3	10
2	[6]

SF of the question-series is $(10+3+2)= '15'$. As per rule No.(a) (i) subtract the MN '10' from the SF '15' $(15-10=5)$ and being odd-number of Saṅkhyā further add figure '1' also to the remainder of which the total $(5+1)= '6'$ is the answer-serial-number.

9. **What is the Vilōma-serial-number of the series 'I O I' of 5-DP from the MN? (2-5-10-I O I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

As Saṅkhyā of 5-DP is of even-number '10' the MN is '5'.

I	O	I
1	(2)	6
		[3]

SF of the question-series is $(6+1)= '7'$. As per rule No. (a) (i) subtract the MN '5' from the SF '7' of which the remainder $(7-5)= '2'$ is the answer-serial-number.

3. Akhaṇḍa-anulōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

10. **What is the Anulōma-serial-number of the series 'I O O O O' of 6-DP from the MN? (2-6-19-I O O O O)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

As Saṅkhyā of 6-DP is of odd-number '19' the MN is '10'.

I	O	O	O	O
1	(2)	(3)	(6)	(10)

SF of the question series is '1'. As per rule No.(a) (ii) subtract the SF '1' from the MN '10' $(10-1=9)$ and being odd-number of Saṅkhyā further subtract figure '1' also of which the remainder $(9-1)= '8'$ is the answer-serial-number.

11. **What is the Anulōma-serial-number of the series 'I O O O' of 5-DP from the MN? (2-5-10-I O O O)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

As Saṅkhyā of 5-DP is of even-number '10' the MN is '5'.

I	O	O	O
1	(2)	(3)	(6)

SF of the question series is '1'. As per rule No.(a) (ii) subtract the SF '1' from the MN '5' and the remainder (5-1=) '4' is the answer-serial-number.

4. Akhaṇḍa-vilōma-uddiṣṭa :

12. **What is the Vilōma-serial-number of the 12-DP containing 'I OŠO I' in the series of Aṅgas? (2-12-632-I OŠO I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

I	O	Š	O	I
1	(2)	61	(108)	350
		33		[196]
		10		
		[3]		

SF of the question series (350+61+33+10+1=) '455' and as per rule No. (b) add figure '1' to the SF of which the total (455+1=) '456' is the answer-serial-number.

5. Akhaṇḍa-vilōma-madhyarūpa-uparisthita-uddiṣṭa :

13. **What is the Vilōma-serial-number of the 7-DP from the MN containing 'S O O O' in the series of Aṅgas? (2-7-33-S000)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation. As the respective Saṅkhyā of the 7-DP is of the odd number '33' the MN is the 17th permutation.

S	O	O	O
3	(6)	(10)	(19)
2			

The SF is (3+2=) '5' and as per rule No. (b)(i) subtract the SF from the MN (17-5=12) along with figure '1' of which the last remainder (12-1=) '11' is the answer-serial-number.

6. Akhaṇḍa-vilōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

14. **What is the Anulōma-serial-number of the 5-DP from the MN containing 'O I I' in the series of Aṅgas? (2-5-10-O I I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation. As the respective Saṅkhyā '10' is the even number the last permutation of the first-half of the 10 permutations i.e., the 5th permutation is the MN.

O	I	I
	2	6
		[3]

The SF is (6+2=) '8'. As per rule No.(b)(ii) subtract the MN from the SF (8-5=3) and add figure '1' of which the last figure (3+1=) '4' is the answer-serial-number.

B. KHAṆḌA-PRASTĀRA

7. Khaṇḍa-hīna-anulōma-uddiṣṭa :

15. What is the serial number of DDP of 12-DP containing 'Ṣ Ṣ' in the series of Aṅgas?
(2-12-1-0-29-Ṣ Ṣ)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

Note : It should be noted that the lowest Aṅga for the lowest-line of Druta-mēru is Laghu as it is DDPs' line.

Ṣ	Ṣ
2	15
1	8
	[4]

SF of the question-series is (15+8+2+1=) '26' and as per rule No. (a) (29-26=) '3' is the answer-serial-number.

16. What is the serial number of DDP of 12-DP containing 'Ṣ I S' in the series of Aṅgas ?
(2-12-1-0-29-Ṣ I S)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

Ṣ	I	S
2	(4)	15
1		[8]

SF of the question-series is (15+2+1=) '18' and as per rule No. (a) (29-18=) '11' is the answer-serial-number.

17. What is the serial number of DDP of 12-DP containing 'S I S I' in the series of Aṅgas ?
(2-12-1-0-29-S I S I)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

S	I	S	I
1	(2)	8	(15)
		[4]	

SF of the question-series is (8+1=) '9' and as per rule No. (a) (29-9=) '20' is the answer-serial-number.

18. What is the serial number of DDP of 12-DP containing '+ I I' in the series of Aṅgas?
(2-12-10-29-+ II)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

$$\begin{array}{r} + \\ 4 \\ 2 \\ 1 \end{array} \quad \begin{array}{r} I \\ (8) \end{array} \quad \begin{array}{r} I \\ (15) \end{array}$$

SF of the question-series is $(4+2+1=)$ '7' and as per rule No. (a) $(29-7=)$ '22' is the answer-serial-number.

8. Khaṇḍa-hīna-anulōma-madhyarūpa-uparisthita-uddiṣṭa :

19. What is the Vilōma-serial-number of the DDP of 8-DP from the MN containing 'I S I' in the series of figures ? (2-8-1-0-8-ISI)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation. As the respective Saṅkhya '8' is the even number the last permutation of the first half of the 8 permutations i.e., the 4th permutation is the MN.

$$\begin{array}{r} I \\ 2 \\ 1 \end{array} \quad \begin{array}{r} S \\ (4) \end{array} \quad \begin{array}{r} I \\ (15) \end{array}$$

The SF is '2'. As per rule No. (a)(i) after subtracting the SF from the MN $(4-2=2)$ along with figure '1' the last remainder $(2-1=)$ '1' is the answer-serial-number.

9. Khaṇḍa-hīna-anulōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

20. What is the Anulōma-serial-number of the DDP of 12-DP from the MN containing '+ S' in the series of figures ? (2-12-1-0-29-+S)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation. As the respective Saṅkhya '29' is the odd number the MN is the 15th permutation.

$$\begin{array}{r} + \\ 4 \\ 2 \\ 1 \end{array} \quad \begin{array}{r} S \\ 15 \\ [8] \end{array}$$

The SF is $(15+4+2+1=)$ '22'. As per rule No.(a)(ii) subtract the MN from the SF $(22-15=7)$ and add figure '1' of which the last figure $(7+1=)$ '8' is the answer-serial-number.

10. Khaṇḍa-hīna-vilōma-uddiṣṭa :

21. What is the Vilōma-serial-number of the DDP of 12-DP containing 'I S I S' in the series of Aṅgas? (2-12-1-0-29-I S I S)

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

$$\begin{array}{r} I \\ 2 \\ 1 \end{array} \quad \begin{array}{r} S \\ (4) \end{array} \quad \begin{array}{r} I \\ 15 \\ [8] \end{array} \quad \begin{array}{r} S \\ (15) \end{array}$$

SF of the question series is $(15+2=)$ '17'. As per rule No. (b) add figure '1' to the SF and the total $(17+1=)$ '18' is the answer-serial number.

11. Khaṇḍa-hīna-vilōma-madhyarūpa-uparisthita-uddiṣṭa :

- 22. What is the Vilōma-serial-number of the DDP of 12-DP from the MN containing 'I S I S' in the series of Aṅgas? (2-12-1-0-29-I S I S)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation. As Saṅkhyā of DDP of 12-DP is of odd-number '29' the MN is '15'.

I	S	I	S
	2	(4)	15
			[8]

SF of question series is $(15+2=)$ '17'. As per rule No. (b) (i) subtract the MN '15' from the SF '17' $(17-15=2)$ and being odd number of Saṅkhyā further add figure '1' also by which the total $(2+1=)$ '3' is the answer-serial-number.

- 23. What is the Vilōma-serial-number of the DDP of 8-DP from the MN containing 'I Ś' in the series of Aṅgas? (2-8-1-0-8-I Ś)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation. As Saṅkhyā of DDP of 12-DP is of even-number '8' the MN is Anulōma-4.

1	Ś
	4
	2

SF of the questions series is $(4+2=)$ '6'. As per rule No. (b) (i) subtract the MN '4' from the SF '6' and the remainder $(6-4=)$ '2' is the answer-serial-number.

12. Khaṇḍa-hīna-vilōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

- 24. What is the Anulōma-serial-number of the DDP of 12-DP from the MN containing 'S Ś I' in the series of Aṅgas? (2-12-1-0-29-S Ś I)**

As per rule No.1 Naṣṭa write Saṅkhyā upto the required permutation. As Saṅkhyā of DDP of 12-DP is of odd-number '29' the MN is '15'.

S	Ś	I
1	8	(15)
	4	
		[2]

SF of the question series is $(8+4+1=)$ '13'. As per rule No. (b) (ii) subtract the SF '13' from the MN '15' $(15-13=2)$ and being odd-number of Saṅkhyā further subtract figure '1' also by which the last remainder $(2-1=)$ '1' is the answer-serial-number.

- 25. What is the Anulōma-serial-number of the DDP of 8-DP from the MN containing 'S I I' in the series of Aṅgas? (2-8-1-0-8-S I I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation. As Saṅkhyā of DDP of 8-DP is of even-number '8' the MN is Anulōma-4.

S	I	I
1	(2)	(4)

SF of the question series is '1'. As per rule No. (b) (ii) subtract the SF '1' from the MN and the remainder (4-1=) '3' is the answer-serial-number.

13. Khaṇḍa-yukta-anulōma-uddiṣṭa :

- 26. What is the serial number of 1-DCP of 9-DP containing 'I O Ś' in the series of Aṅgas? (2-9-1-1-28-I O Ś)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

I	O	Ś
		8
		12
		5

Note : It should be noted that the above Druta and Laghu after Pluta are written only to fill-in the deficit value of the prastāra.

SF of the question-series is (8+12+5=) '25' and as per rule No. (a) (28-25=) '3' is the answer-serial-number.

- 27. What is the serial number of 1-DCP of 9-DP containing 'S O S' in the series of Aṅgas? (2-9-1-1-28-S O S)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

S	O	S
1	(2)	8
		12
		[5]

SF of the question-series is (8+12+1=) '21' and as per rule No. (a) (28-21=) '7' is the answer-serial-number.

- 28. What is the serial number of 1-DCP of 9-DP containing 'S O I I' in the series of Aṅgas? (2-9-1-1-28-S O I I)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

S	O	I	I
1	(2)	4	8
		[5]	[12]

SF of the question-series is (8+4+1=) '13' and as per rule No. (a) (28-13=) '15' is the answer-serial-number.

- 29. What is the serial number of 2-DCP of 8-DP containing 'O I O S' in the series of Aṅgas? (2-8-1-2-25-O I O S)**

As per rule No.1 of Naṣṭa write Saṅkhyā upto the required permutation.

O	I	O	S
	<u>1</u>	<u>(2)</u>	<u>12</u>
			9
			[3]

SF of the question-series is $(12+9+1=)$ '22' and as per rule No. (a) $(25-22=)$ '3' is the answer-serial-number.

- 30. What is the serial number of 1-ACP of 10-AP pertaining to Trisra-jāti containing 'S I U' in the series of Aṅgas? (3-10-1-1-32-S I U)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

S	I	U
<u>1</u>	<u>3</u>	<u>(8)</u>
<u>1</u>	<u>[2]</u>	

SF of the question-series is $(3+1+1=)$ '5' and as per rule No. (a) $(32-5=)$ '27' is the answer-serial-number.

- 31. What is the serial number of 1-1-UCP of 8-UP containing '2 3 1 2' in the series of Aṅgas? (1-8-1-1-26-2 3 1 2)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

2	3	1	2
	<u>1</u>	<u>(3)</u>	<u>8</u>
			[8]

SF of the question-series is $(8+1=)$ '9' and as per rule No. (a) $(26-9=)$ '17' is the answer-serial-number.

- 32. What is the serial number of 1-1-UCP of 8-UP containing '4 3 1' in the series of Aṅgas? (1-8-1-1-26 - 4 3 1)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

4	3	1
<u>1</u>	<u>3</u>	<u>(8)</u>
	<u>[2]</u>	

SF of the question-series is $(3+1=)$ '4' and as per rule No. (a) $(26-4=)$ '22' is the answer-serial-number.

14. Khaṇḍa-yukta-anulōma-madhyarūpa-uparisthita-uddiṣṭa :

- 33. What is the Vilōma-serial-number of the 1-DCP of 9-DP from the MN containing 'O Ś I' in the series of Aṅgas ? (2-9-1-1-28-O Ś I)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation. As the respective Saṅkhya '28' is the even number the last permutation of the first-half of the '28' permutations i.e., the 14th permutation is the MN.

O	Ś	1
	4	8
	5	[12]
	2	

The SF is (8+4+5+2=) '19'. As per rule No. (a) (i) subtract the MN from the SF and the remainder (19-14=) '5' is the answer-serial- number.

15. Khaṇḍa-yukta-anulōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

- 34. What is the Anulōma-serial-number of the 2-DCP of 8-DP from the MN containing 'S O O' in the series of Aṅgas ? (2-8-1-2-25-SOO)**

As per rule No. 1 of Naṣṭa write Saṅkhya upto the required permutation. As the respective Saṅkhya '25' is the odd-number the MN is the 13th permutation.

S	O	O
2	(4)	(12)
1		

The SF is (2+1=) '3'. As per rule No. (a)(ii) subtract the SF from the MN (13-3=10) along with figure '1' and the last remainder (10-1=) '9' is the answer-serial-number.

16. Khaṇḍa-yukta-vilōma-uddiṣṭa :

- 35. What is the Vilōma-serial-number of the 2-DCP of 8-DP containing 'O O S I' in the series of Aṅgas? (2-8-1-2-25-O O S I)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

O	O	S	I
		<u>5</u>	<u>12</u>
		<u>3</u>	[9]

SF of the question series is (12+5+3=) '20'. As per rule No. (b) add figure '1' to the SF and the total (20+1=) '21' is the answer-serial number.

17. Khaṇḍa-yukta-vilōma-madhyarūpa-uparisthita-uddiṣṭa :

- 36. What is the Vilōma-serial-number of the 1-DCP of 9-DP from the MN containing 'S S O' in the series of Aṅgas? (2-9-1-1-28-S S O)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation. As Saṅkhya of 1-DCP of 9-DP is of even-number '28' the MN is Anulōma-14.

S	S	O
<u>1</u>	<u>4</u>	<u>(8)</u>
	[2]	

SF of the question series is (4+1=) '5'. As per rule No.(b) (i) subtract the SF '5' from the MN (14-5=9) and also subtract figure '1' from the remainder by which the last remainder (9-1=) '8' is the answer-serial-number.

18. Khaṇḍa-yukta-vilōma-madhyarūpa-adhaṣṭhita-uddiṣṭa :

- 37. What is the Anulōma-serial-number of the 1-DCP of 9-DP from the MN containing 'S O S' in the series of Aṅgas? (2-9-1-1-28-S O S)**

As per rule No.1 of Naṣṭa write Saṅkhya upto the required permutation.

As Saṅkhya of 1-DCP of 9-DP is of even-number '28' the MN is '14'.

S	O	S
<u>1</u>	<u>(2)</u>	<u>8</u>
		12
		[5]

SF of the question series is $(8+12+1=)$ '21'. As per rule No.(b) (ii) subtract the MN '14' from the SF $(21-14=7)$ and add figure '1' to the remainder by which the last figure $(7+1=)$ '8' is the answer-serial-number.

4.3. KALITA

'Kalita' is the easy method for obtaining the full particulars of all the Aṅgas used in the process of permutation up to the required prastāra in question avoiding the laborious process of the permutation. There are two methods in it. In the first method of brief analysis the figures of both Saṅkhya and Mahāpātāḷa have to be utilised and in the second method of detailed analysis the figure of either Saṅkhya or of both Saṅkhya and Mahāpātāḷa have to be utilised. The full details in which these two methods are elaborated are furnished hereunder along with suitable examples and diagrams for easy understanding.

A. AKHAṆḌA-PRASTĀRA :

1. Akhaṇḍa-anulōma-kalita:

1. Give the particulars of all the Aṅgas occurring upto the 50th prastāra of 8-DP (2-8-61-50).

In the mode of Pañcāṅga-prastāra the 1st, 2nd, 4th, 6th and 8th proxies represent Druta, Laghu, Guru, Pluta and Kākapāda respectively and the particulars of both Saṅkhya and Mahāpātāḷa should be written upto the required prastāra as in the table '1'.

According to this table, at the outset, it could be understood that as per the:

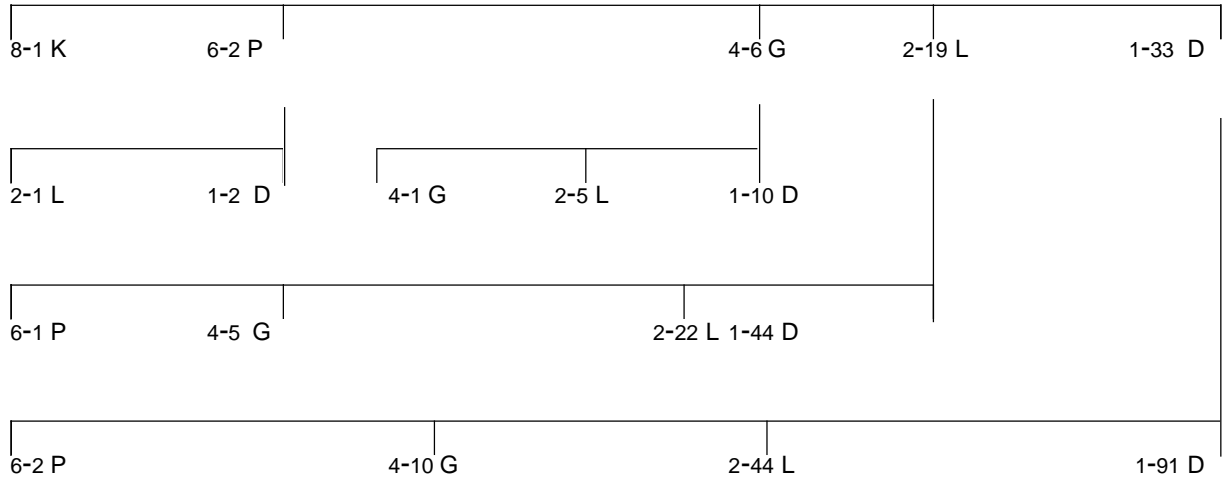
1st	proxy there is/are	33 DEPs	along with	147	Aṅgas,
2nd	-do-	19 LEPs	-do-	72	-do-
4th	-do-	6 GEPs	-do-	16	-do-
6th	-do-	2 PEPs	-do-	3	-do-
8th	-do-	1 KEP	-do	-	-do-

--- thus totalling to '61' prastāras along with '299' Aṅgas.

These '61' permutations starting with Kākapāda (+) in the first permutation in the process of Anulōma-prastāra could be analysed in the following manner.

- (a) As per the Saṅkhya '1' of the corresponding 8th KEP proxy, as its corresponding Mahāpātāḷa does not exist, it should be understood that there is only '1' KEP with a single Aṅga i.e., Kākapāda (had there been any figure of Mahāpātāḷa beneath this Saṅkhya figure '1' there would have been the union of some other Aṅga also along with this Kākapāda).
- (b) According to the brief analysis, as per the Saṅkhya '2' and its Mahāpātāḷa '3' of the corresponding 6th PEP proxy, it should be understood that, apart from the '2' Plutas which are in the right extreme end of these '2' PEPs, there are '3' other Aṅgas also thus totalling to $(2+3=)$ '5' Aṅgas in all these '2' PEPs. Here it is also interesting to know that there are only '5' Plutas in all these '61' prastāras. According to the detailed analysis it may also be noted that, in these '2' PEPs, there

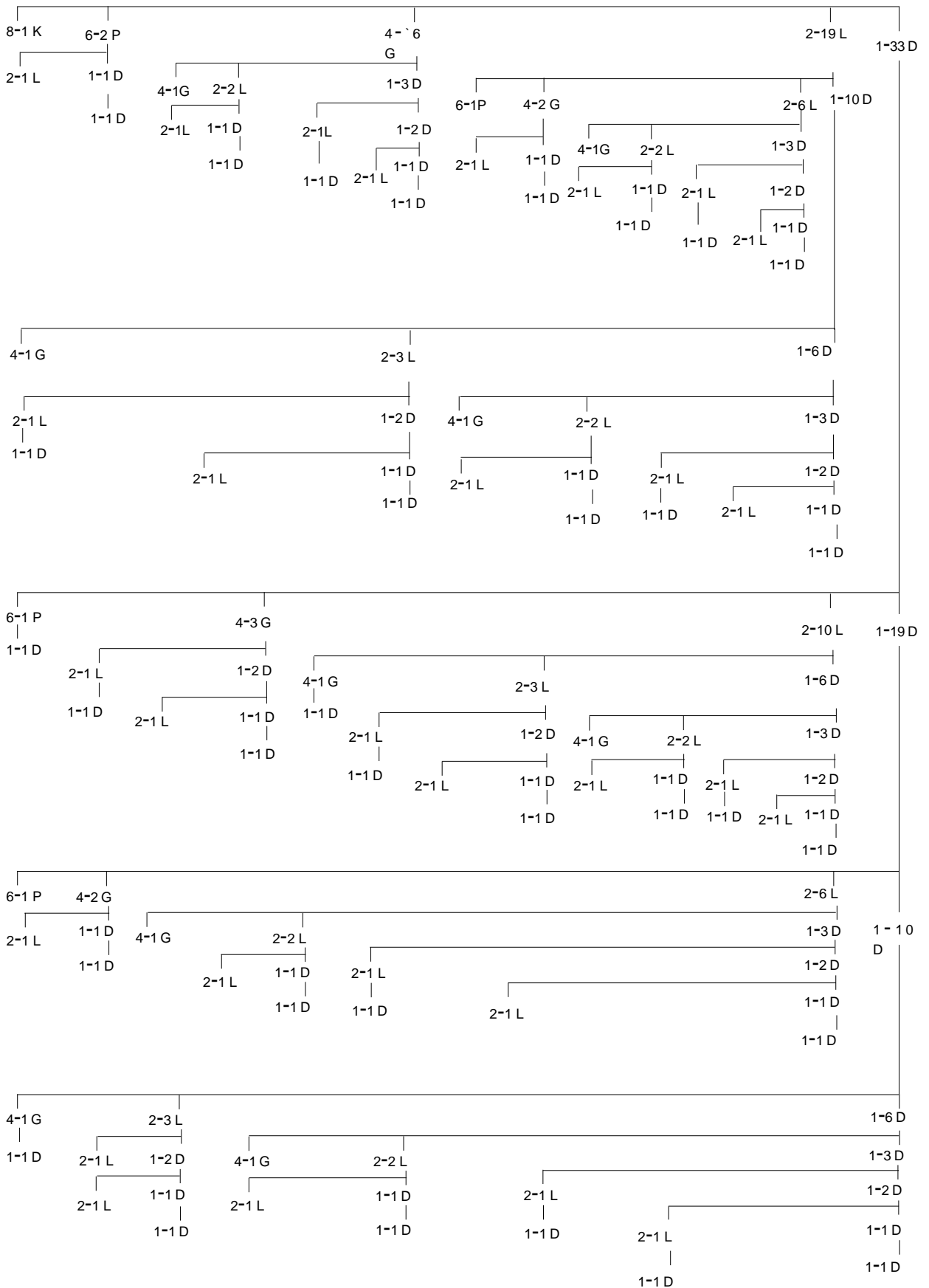
5. KALITA - 8 DP(61) - BRIEF VERSION



are '2' Plutas as per the Saṅkhya '2' of this 6th PEP proxy, '1' Laghu as per the Saṅkhya '1' (no Mahāpātāḷa) of the corresponding 2nd LEP proxy and '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 1st DEP proxy of the same PEP proxy --- thus striking the total to (2P+1L+2D=) '5' Aṅgas.

- (c) According to the brief analysis, as per the Saṅkhya '6' and its Mahāpātāḷa '16' of the corresponding 4th GEP proxy, it should be understood that, apart from the '6' Gurus which are in the right extreme end of these prastāras, there are '16' other Aṅgas also, thus totalling to (6+16=) '22' Aṅgas in all these '6' GEPs. Here it is also interesting to know that there are '22' Gurus only in all these '61' prastāras. According to the detailed analysis, it may also be noted that, in these '6' GEPs, there are '6' Gurus as per the Saṅkhya '6' of this 4th GEP proxy, '1' Guru as per the Saṅkhya '1' (no Mahāpātāḷa) of the corresponding 4th GEP proxy, '5' Laghus as per the SM-figure (2+3=) '5' of the corresponding 2nd LEP proxy and '10' Drutas as per the SM-figure (3+7=) '10' of the corresponding 1st DEP proxy of the same GEP proxy ---- thus striking the total to (6G+1G+5L+10D=)'22' Aṅgas.
- (d) According to the brief analysis, as per the Saṅkhya '19' and its Mahāpātāḷa '72' of the corresponding 2nd LEP proxy, it should be understood that, apart from the '19' Laghus which are in the right extreme end of these prastāras, there are '72' other Aṅgas also thus totalling to (19+72=) '91' Aṅgas in all these '19' LEPs. Here it is also interesting to know that there are only '91' Laghus in all these '61' prastāras. According to the detailed analysis, it may also be noted that, in these '19' LEPs, there are '19' Laghus as per the Saṅkhya '19' of this 2nd LEP proxy, '1' Pluta as per the Saṅkhya '1' (no Mahāpātāḷa) of the corresponding 6th PEP proxy, '5' Gurus as per the SM-figure (2+3=) '5' of the corresponding 4th GEP proxy, '22' Laghus as per the SM-figure (6+16=) '22' of the corresponding 2nd LEP proxy and '44' Drutas as per the SM-figure (10+34=) '44' of the DEP proxy of the same LEP proxy ---- thus striking the total to (19L+1P+5G+22L+44D=) '91' Aṅgas.
- (e) According to the brief analysis, as per the Saṅkhya '33' and its Mahāpātāḷa '147' of the corresponding 1st DEP proxy, it should be understood that, apart from these '33' Drutas which are in the right extreme end of these prastāras, there are '147' other Aṅgas also thus totalling to (33+147=)

6. KALITA - 8 DP(61) - DETAILED VERSION



7. KALITA - 8 DP(50/61) - BRIEF & DETAILED VERSIONS

		S	K 8	P 6	G 4	L 2	D 1	Total	M
(a)		1	1	-	-	-	-	1	1
(b)		2	-	2	-	-	-	2	
		"	-	-	-	1	2	3	5
(c)		6	-	-	6	-	-	6	
		"	-	-	1	5	10	16	22
(d)		19	-	-	-	19	-	19	
		"	-	1	5	22	44	72	91
		28	1	3	12	47	56	119	119
		33	-	-	-	-	33	33	
		"	-	2	10	44	91	147	180
		61	1	5	22	91	180	299	299
(e)	(i)	22	-	-	-	-	22	22	22
	(ii)		-	1	-	-	1	2	2
	(iii)		-	-	3	-	-	3	
			-	-	-	2	5	7	10
	(iv)		-	-	-	10	-	10	
			-	-	2	10	22	34	44
	(v)		-	-	-	-	8	8	
			-	1	-	-	-	1	
			-	-	2	-	-	2	
			-	-	-	1	2	3	14
			-	-	-	5	-	5	
			-	-	1	-	-	1	
			-	-	-	2	-	2	
			-	-	-	1	2	3	11
			-	-	-	-	2	2	
			-	-	-	1	1	2	
			-	-	-	1	1	2	6
		22	-	2	8	33	66	109	109
		50	1	5	20	80	122	228	228

'180' Aṅgas in all these '33' DEPs. Here it is also interesting to know that there are only '180' Drutas in all these '61' prastāras. According to the detailed analysis, it may also be noted that, in these '33' DEPs, there are '33' Drutas as per the Saṅkhyā '33' of this 1st DEP proxy, '2' Plutas as per the SM-figure (1+1=) '2' of the corresponding 6th PEP proxy, '10' Gurus as per the SM-figure (3+7=) '10' of the corresponding 4th GEP proxy, '44' Laghus as per the SM-figure (10+34=) '44' of the corresponding 2nd LEP proxy and '91' Drutas as per the SM-figure (19+72=) '91' of the corresponding 1st DEP proxy of the same DEP proxy ---- thus striking the total to (33D+2P+10G+44L+91D=) '180' Aṅgas.

But, as per the question of Kalita, as we require the details upto the 50th permutation of the above, besides the details of '1' KEP, '2' PEPs, '6' GEPs and '19' LEPs totalling to (1+2+6+19=) '28' permutations, the details of the remaining '22' DEPs out of the '33' DEPs are also required. To obtain the details of these '22' DEPs, from the beginning, '1' PEP as per the 6th PEP-proxy, '3' GEPs as per the 4th GEP-proxy, '10' LEPs as per the 2nd LEP-proxy and the first '8' DEPs out of the '19' DEPs as per the 1st DEP-proxy --- thus totalling to (1P+3G+10L+8D=) '22' permutations are to be analysed. So, now, according to the next part of the analysis, we should understand that there are:

- i) '22' Drutas lying in the right extreme end of each of the first '22' DEPs;
- ii) '1' Pluta as per the Saṅkhyā '1' of its corresponding 6th PEP-proxy and '1' Druta as per the Saṅkhyā '1' (no Mahāpātāḷa) of the corresponding 1st DEP-proxy --- thus totalling to (1P+1D=) '2' Aṅgas;
- iii) '3' Gurus as per the Saṅkhyā '3' of its corresponding 4th GEP-proxy, '2' Laghus as per the SM-figure (1+1=) '2' of the corresponding 2nd LEP-proxy and '5' Drutas as per the SM-figure (2+3=) '5' of the corresponding 1st DEP-proxy --- thus totalling to (3G+2L+5D=) '10' Aṅgas;
- iv) '10' Laghus as per the Saṅkhyā '10' of its corresponding 2nd LEP-proxy, '2' Gurus as per the SM-figure (1+1=) '2' of the corresponding 4th GEP-proxy, '10' Laghus as per the SM-figure (3+7=) '10' of the corresponding 2nd LEP-proxy and '22' Drutas as per the SM-figure (6+16=) '22' of the corresponding 1st DEP-proxy --- thus totalling to (10L+2G+10L+22D=) '44' Aṅgas.
- v) '8' Drutas in the first '8' DEPs out of the '19' DEPs as per its 1st DEP-proxy;
'1' Pluta as per the Saṅkhyā (no Mahāpātāḷa) of the corresponding 6th PEP-proxy;
'2' Gurus as per the Saṅkhyā of the corresponding 4th GEP-proxy,
'1' Laghu as per the Saṅkhyā (no Mahāpātāḷa) of the corresponding 2nd LEP-proxy and '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 1st DEP-proxy of the same 4th GEP-proxy;
'5' Laghus in the first '5' LEPs out of the '6' LEPs as per the corresponding 2nd LEP-proxy; '1' Guru as per the Saṅkhyā (no Mahāpātāḷa) of the corresponding 4th GEP-proxy; '2' Laghus as per the Saṅkhyā of the corresponding 2nd LEP-proxy; '1' Laghu as per the Saṅkhyā (no Mahāpātāḷa) of the corresponding 2nd LEP-proxy; '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 1st DEP-proxy of the same 2nd LEP-proxy;
'2' Drutas of the 1st DEP-proxy of the required '2' permutations out of '3' DEPs; '1' Laghu as per the Saṅkhyā of the corresponding 2nd LEP-proxy and again '1' Druta as per the Saṅkhyā of the corresponding 1st DEP-proxy of the same 2nd LEP-proxy and '1' Druta out of the '2' DEPs as

per the Saṅkhyā of the corresponding 1st DEP-proxy and again '1' Laghu as per the Saṅkhyā of the corresponding 2nd LEP- proxy of the same 1st DEP-proxy -- thus striking the total to $(8D+1P+2G+1L+2D+5L+1G+2L+1L+ 2D+2D+1L+1D+1D+1L=)$ '31' Aṅgas.

The table and diagram of the above analysis are furnished here.

B. KHAṆḌA-PRASTĀRA

1. Khaṇḍa-hīna-anulōma-kalita:

2. Give the details of all the Aṅgas occurring upto the 20th DDP of 12-DP (2-12-1-0-29-20)

In the mode of Pañcāṅga-prastāra the 1st, 2nd, 4th, 6th and 8th proxies represent Druta, Laghu, Guru, Pluta and Kākapāda respectively and for writing the figures of the lowest-line of the Druta-mēru, the total of the existing proxies mentioned above, except the 1st DEP-proxy being the lowest-line pertaining to the DDPs should be written as in the table '2'.

According to this table, at the outset, it could be understood that as per the:

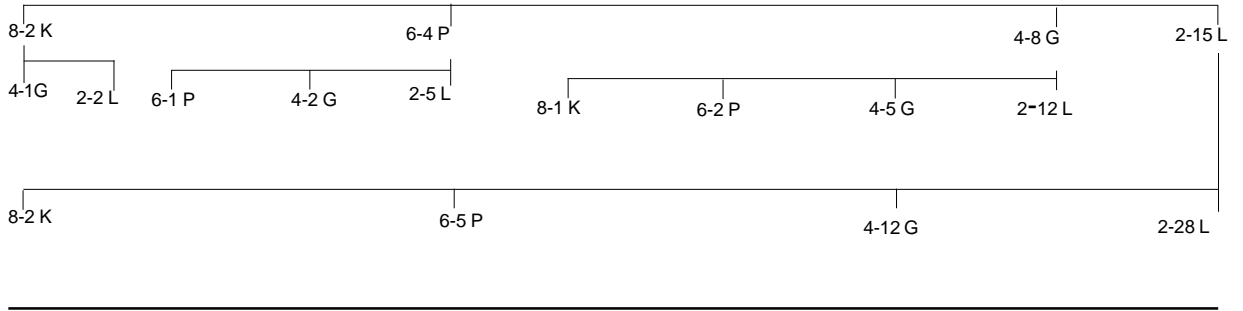
2nd	proxy there are	15 LEPs	along with	47	Aṅgas,
4th	-do-	8 GEPs	-do-	20	-do-
6th	-do-	4 PEPs	-do-	8	-do-
8th	-do-	2 KEPs	-do-	3	-do-

--- totalling to '29' permutations along with '107' Aṅgas.

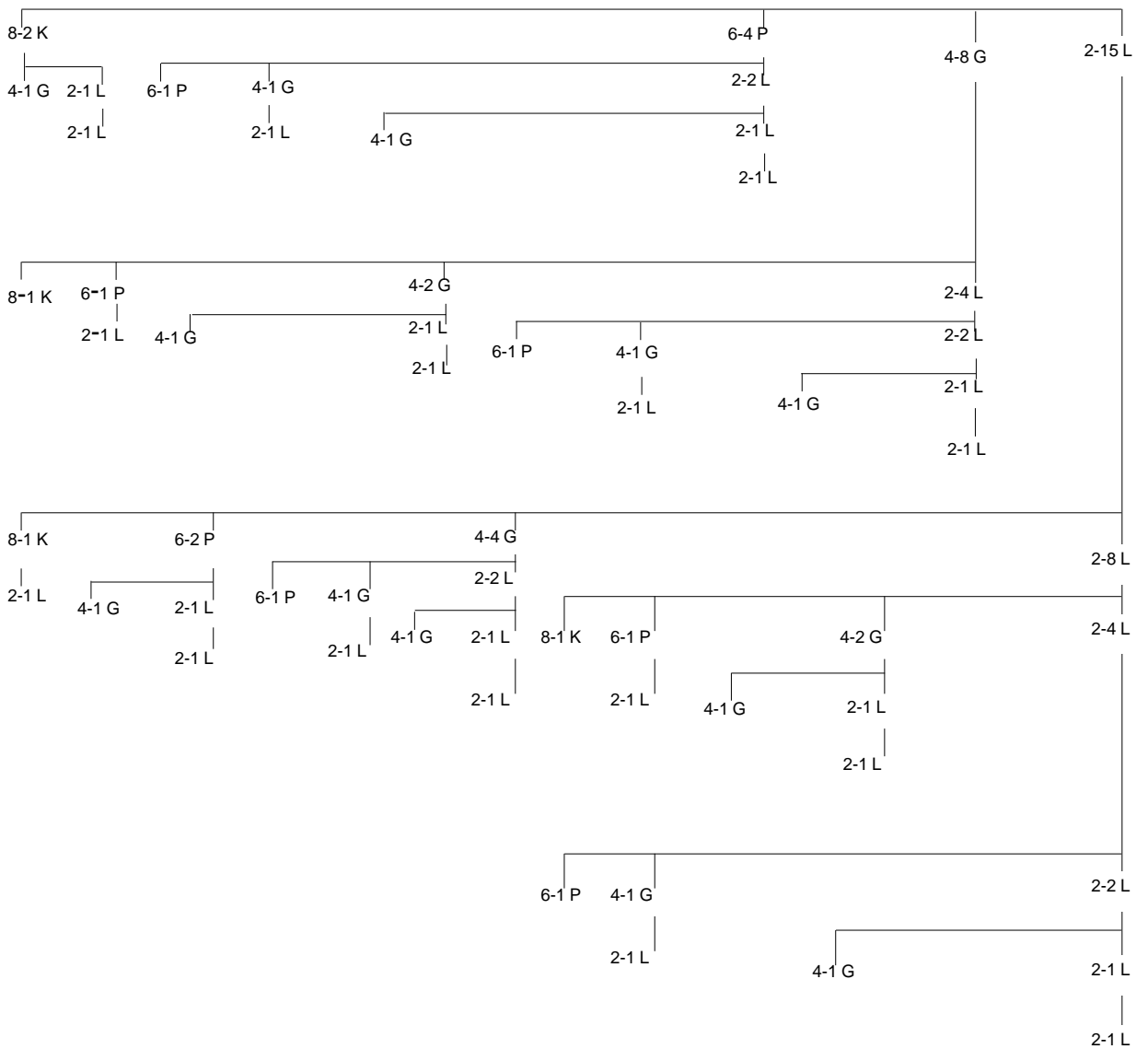
The '29' permutations starting with 'Kākapāda-guru (S+)' in the first permutation in the process of Anulōma-prastāra could be analysed in the following manner:

- According to the brief analysis, as per the SM-figure $(2+3=)$ '5' of the corresponding 8th KEP-proxy, it should be understood that, apart from these '2' Kākapādas which are in the right extreme end of each of these prastāras, there are '3' other Aṅgas also thus totalling to $(2+3=)$ '5' Aṅgas in all these '2' KEPs. Here it is also interesting to know that there are '5' Kākapādas only in all these '29' permutations. According to the detailed analysis it may also be noted that, in these '2' KEPs there are '2' Kākapādas as per the Saṅkhyā '2' of this 8th KEP-proxy, '1' Guru as per the Saṅkhyā '1' (no Mahāpātāḷa) of the corresponding 4th GEP-proxy, '2' Laghus as per the SM-figure $(1+1=)$ '2' of the corresponding 2nd LEP-proxy of the same KEP proxy --- thus striking the total to $(2K+1G+2L=)$ '5' Aṅgas.
- According to the brief analysis, as per the Saṅkhyā '4' and its Mahāpātāḷa '8' of the corresponding 6th PEP-proxy, it should be understood that, apart from the '4' Plutas which are in the right extreme end of each of these prastāras, there are '8' other Aṅgas also thus totalling to $(4+8=)$ '12' Aṅgas in all these '4' PEPs. Here it is also interesting to know that there are '12' Plutas only in all these '29' permutations. According to the detailed analysis it may also be noted that, in these '4' PEPs, there are '4' Plutas as per the Saṅkhyā '4' of this 6th PEP-proxy, '1' Pluta as per the Saṅkhyā '1' (no Mahāpātāḷa) of the corresponding 6th PEP-proxy, '2' Gurus as per the SM-figure $(1+1=)$ '2' of the corresponding 4th GEP-proxy and '5' Laghus as per the SM-figure $(2+3=)$ '5' of the corresponding 2nd LEP-proxy of the same PEP proxy --- thus striking the total to $(4P+1P+2G+5L=)$ '12' Aṅgas;
- According to the brief analysis, as per the Saṅkhyā '8' and its Mahāpātāḷa '20' of the 4th GEP-proxy, it should be understood that, apart from the '8' Gurus which are in the right extreme end of

8. KALITA - 12 DP - DDP(29) - BRIEF VERSION



9. KALITA - 12 DP - DDP(29) - DETAILED VERSION



10. KALITA - 12 DP - DDP(20/29) - BRIEF & DETAILED VERSIONS

		S	K	P	G	L	D	Total	M
		2	8	6	4	2	1		
(a)		2	2	-	-	-	x	2	
		„	-	-	1	2	x	3	5
(b)		4	-	4	-	-	x	4	
		„	-	1	2	5	x	8	12
(c)		8	-	-	8	-	x	8	
		„	1	2	5	12	x	20	28
		14	3	7	16	19	x	45	45
		15	-	-	-	15	x	15	
		„	2	5	12	28	x	47	62
		15	2	5	12	43	x	62	62
		29	5	12	28	62	x	107	107
	(i)	6	-	-	-	6	x	6	6
	(ii)		1	-	-	-	x	1	
			-	-	-	1	x	1	2
	(iii)		-	2	-	-	x	2	
			-	-	1	2	x	3	5
	(iv)		-	-	3	-	x	3	
			-	1	-	-	x	1	
			-	-	1	-	x	1	
			-	-	-	1	x	1	
			-	-	-	1	x	1	
			-	-	1	-	x	1	8
		6	1	3	6	11	x	21	21
		20	4	10	22	30	x	66	66

each of these prastāras there are '20' other Aṅgas also thus totalling to $(8+20=)$ '28' Aṅgas in all these '8' GEPs. Here it is also interesting to know that there are '28' Gurus only in all these '29' permutations. According to the detailed analysis it may also be noted that, in these '8' GEPs, there are '8' Gurus as per the Saṅkhya of this 4th GEP-proxy, '1' Kākapāda as per the Saṅkhya '1' (no Mahāpātāḷa) of the corresponding 8th KEP-proxy, '2' Plutas as per the SM-figure $(1+1=)$ '2' of the corresponding 6th PEP-proxy, '5' Gurus as per the SM-figure $(2+3=)$ '5' of the corresponding 4th GEP-proxy and '12' Laghus as per the SM-figure $(4+8=)$ '12' of the corresponding 2nd LEP-proxy of the same GEP-proxy --- thus striking the total to $(8G+1K+2P+5G+12L=)$ '28' Aṅgas.

- (d) According to the brief analysis, as per the Saṅkhya '15' and its Mahāpātāḷa '47' of the 2nd LEP-proxy, it should be understood that, apart from the '15' Laghus which are in the right extreme end of each of these prastāras there are '47' other Aṅgas also thus totalling to $(15+47=)$ '62' Aṅgas in all these '15' LEPs. Here it is also interesting to know that there are '62' Laghus only in all these '29' permutations. According to the detailed analysis it may also be noted that, in these '15' LEPs, there are '15' Laghus as per the Saṅkhya '15' of this 2nd LEP-proxy, '2' Kākapādas as per the SM-figure $(1+1=)$ '2' of the corresponding 8th KEP-proxy, '5' Plutas as per the SM-figure $(2+3=)$ '5' of the corresponding 6th PEP-proxy, '12' Gurus as per the SM-figure $(4+8=)$ '12' of the corresponding 4th GEP-proxy and '28' Laghus as per the SM-figure $(8+20=)$ '28' of the corresponding 2nd LEP-proxy of the same DEP-proxy --- thus striking the total to $(15L+2K+5P+12G+28L=)$ '62' Aṅgas.

But, as we require the details upto the 20th permutation of the above, besides the details of '2' KEPs, '4' PEPs and '8' GEPs totalling to $(2+4+8=)$ '14' permutations, the details of the remaining '6' LEPs only out of the '15' LEPs are needed. So, now, according to the next part of the analysis, we should understand that there are;

- i) '6' Laghus lying in the right extreme end of each of its first '6' LEPs;
- ii) '1' Kākapāda as per the Saṅkhya of its corresponding 8th KEP-proxy and '1' Laghu as per the Saṅkhya of the corresponding 2nd LEP-proxy of the same KEP-proxy --- thus totalling to $(1K+1L=)$ '2' Aṅgas;
- iii) '2' Plutas as per the Saṅkhya of the corresponding 6th PEP-proxy, '1' Guru as per the Saṅkhya '1' (no Mahāpātāḷa) of the corresponding 4th GEP-proxy and '2' Laghus as per the SM-figure $(1+1=)$ '2' of the corresponding 2nd LEP-proxy of the same PEP-proxy --- thus totalling to $(2P+1G+2L=)$ '5' Aṅgas;
- iv) '3' Gurus of the '3' GEPs out of the '4' GEPs as per the Saṅkhya of its corresponding 4th GEP-proxy;

'1' Pluta as per the Saṅkhya of the corresponding 6th PEP-proxy;

'1' Guru as per the Saṅkhya of the corresponding 4th GEP-proxy and '1' Laghu as per the Saṅkhya of the corresponding 2nd LEP-proxy;

'1' Laghu of the '1' LEP out of the '2' LEPs as per the Saṅkhya of the corresponding 2nd LEP-proxy and again '1' Guru as per the Saṅkhya of the corresponding 4th GEP-proxy ---- thus totalling to $(3G+1P+1G+1L+1L+1G=)$ '8' Aṅgas.

The table and diagram of the above analysis are furnished here.

3. Khaṇḍa-yukta-anulōma-kalita :

3. Give the details of all the Aṅgas occurring upto the 20th 2-DCP of 8-DP (2-8-1-2-25-20)

In the mode of Pañcāṅga-prastāra the 1st, 2nd, 4th, 6th and 8th proxies represent Druta, Laghu, Guru, Pluta and Kākapāda respectively and for writing the figures of the line of 2-DCPs of Druta-mēru, the total of the existing proxies from the same line and only the 1st DEP-proxy from the immediate lower-line, should be written as in the table '2'.

According to this table, at the outset, it could be understood that as per the:

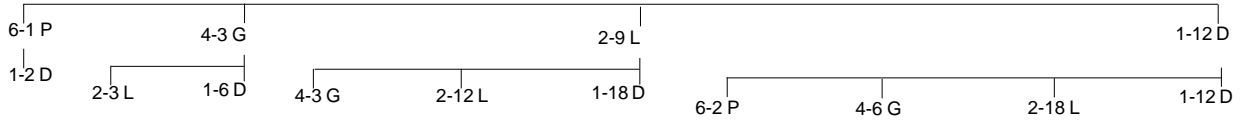
1st	proxy there is/are	12	DEPs	along with	38	Aṅgas,
2nd	-do-	9	LEPs	-do-	33	-do-
4th	-do-	3	GEPs	-do-	9	-do-
6th	-do-	1	PEP	-do-	2	-do-

--- totalling to '25' permutations along with '107' Aṅgas.

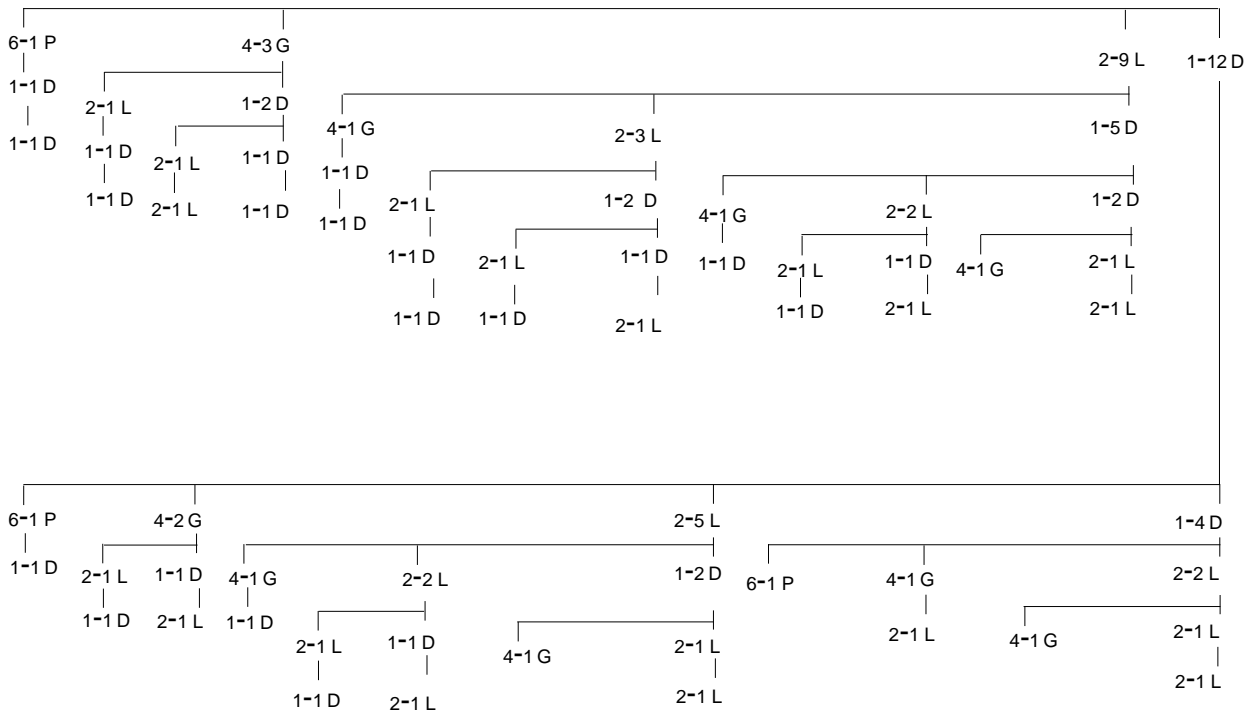
These '25' permutations starting with Pluta and two Drutas (O O Ś) in the first permutation in the process of Anulōma-prastāra could be analysed in the following manner:

- According to the brief analysis, as per the Saṅkhya '1' and its Mahāpātāḷa '2' of the corresponding 6th PEP-proxy, it should be understood that, apart from the '1' Pluta which is in the right extreme end of this prastāra there are '2' other Aṅgas also thus totalling to $(1+2=)$ '3' Aṅgas in this '1' PEP. Here it is also interesting to know that there are '3' Plutas only in all these '25' permutations. According to the detailed analysis it may also be noted that, in this '1' PEP, there are '1' Pluta as per the Saṅkhya '1' of this 6th PEP-proxy and '2' Drutas as per the SM-figure $(1+1=)$ '2' of the 1st DEP-proxy of the immediate lower-line --- thus totalling to $(1P+2D=)$ '3' Aṅgas;
- According to the brief analysis, as per the Saṅkhya '3' and its Mahāpātāḷa '9' of the corresponding 4th GEP-proxy, it should be understood that, apart from the '3' Gurus which are in the right extreme end of each of these prastāras, there are '9' other Aṅgas also thus totalling to $(3+9=)$ '12' Aṅgas in all these '3' GEPs. Here it is also interesting to know that there are '12' Gurus only in all these '25' permutations. According to the detailed analysis, it may also be noted that, in these '3' GEPs, there are '3' Gurus as per the Saṅkhya '3' of this 4th GEP-proxy, '6' Drutas as per the SM-figure $(2+4=)$ '6' of the corresponding 1st DEP-proxy of the immediate lower-line and '3' Laghus as per the SM-figure $(1+2=)$ '3' of the corresponding 2nd LEP-proxy --- thus totalling to $(3G+6D+3L=)$ '12' Aṅgas;
- According to the brief analysis, as per the Saṅkhya '9' and its Mahāpātāḷa '33' of the corresponding 2nd LEP-proxy, it should be understood that, apart from the '9' Laghus which are in the right extreme end of each of these prastāras, there are '33' other Aṅgas also thus totalling to $(9+33=)$ '42' Aṅgas in all these '9' LEPs. Here it is also interesting to know that there are '42' Laghus only in all these '25' permutations. According to the detailed analysis it may also be noted that, in these '9' LEPs, there are '9' Laghus as per the Saṅkhya '9' of this 2nd LEP-proxy, '18' Drutas as per the SM-figure $(5+13=)$ '18' of the corresponding 1st DEP-proxy of the immediate

11. KALITA - 8 DP - 2 DCP(25) - BRIEF VERSION



12. KALITA - 8 DP - 2 DCP(25) - DETAILED VERSION



13. KALITA - 8 DP - 2 DCP(20/25) - BRIEF & DETAILED VERSIONS

		S	K 8	P 6	G 4	L 2	D 1	Total	M
(a)		1	-	1	-	-	-	1	
		„	-	-	-	-	2	2	3
(b)		3	-	-	3	-	-	3	
	„	-	-	-	3	6	9	12	
(c)		9	-	-	-	9	-	9	
	„	-	-	3	12	18	33	42	
		13	-	1	6	24	26	57	57
		12	-	-	-	-	12	12	
		„	-	2	6	18	12	38	50
		12	-	2	6	18	24	50	50
		25	-	3	12	42	50	107	107
(d)	(i)	7	-	-	-	-	7	7	7
	(ii)		-	1	-	-	-	1	
			-	-	-	-	1	1	2
	(iii)		-	-	2	-	-	2	
			-	-	-	2	-	2	
			-	-	-	-	2	2	6
	(iv)		-	-	-	4	-	4	
			-	-	1	-	-	1	
			-	-	-	-	1	1	
			-	-	-	2	-	2	
			-	-	-	2	-	2	
			-	-	-	-	2	2	
			-	-	-	-	1	1	
			-	-	1	-	-	1	14
		7	-	1	4	10	14	29	29
		20	-	2	10	34	40	86	86

lower-line, '12' Laghus as per the SM-figure (3+9=) '12' of the corresponding 2nd LEP-proxy and '3' Gurus as per the SM-figure (1+2=) '3' of the corresponding 4th GEP-proxy --- thus totalling to (9L+18D+12L+3G=) '42' Aṅgas;

- (d) According to the brief analysis, as per the Saṅkhya '12' and its Mahāpātāḷa '39' of the corresponding 1st DEP-proxy of the immediate lower-line, it should be understood that, apart from the '12' Drutas which are in the right extreme end of each of these prastāras, there are '38' other Aṅgas also thus totalling to (12+38=) '50' Aṅgas in all these '12' DEPs. Here it is also interesting to know that there are '50' Drutas only in all these '25' permutations. According to the detailed analysis it may also be noted that, in these '12' DEPs, there are '12' Drutas as per the Saṅkhya '12' of this 1st DEP-proxy of the immediate lower-line, '12' Drutas as per the SM-figure (4+8=) '12' of the corresponding 1st DEP-proxy of the immediate lower-line, '18' Laghus as per the SM-figure (5+13=) '18' of the corresponding 2nd LEP-proxy, '6' Gurus as per the SM-figure (2+4=) '6' of the corresponding 4th GEP-proxy and '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 6th PEP-proxy ---- thus totalling to (12D+12D+18L+6G+2D=) '50' Aṅgas.

But, as we require the details upto the 20th permutation of the above, besides the details of '1' PEP, '3' GEPs and '9' LEPs totalling to (1+3+9=) '13' permutations, the details of the remaining '7' DEPs only out of the '12' DEPs are needed. So, now, according to the next part of the analysis, we should understand that there are:

- i) '7' Drutas lying in the right extreme end of each of the first '7' DEPs;
- ii) '1' Pluta as per the Saṅkhya '1' of its corresponding 6th PEP-proxy;
- iii) '2' Gurus as per the Saṅkhya '2' of its corresponding 4th GEP-proxy, '2' Laghus as per the SM-figure (1+1=) '2' of the corresponding 2nd LEP-proxy and '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 1st DEP-proxy of the immediate lower-line --- thus totalling to (2G+2L+2D=) '6' Aṅgas;
- iv) '4' Laghus of its first '4' LEPs out of the '5' LEPs as per the Saṅkhya '5' of the corresponding 2nd LEP-proxy;

'1' Guru as per the Saṅkhya '1' of the corresponding 4th GEP-proxy, '1' Druta as per the Saṅkhya '1' of the corresponding 1st DEP-proxy of the immediate lower-line; '2' Laghus as per the Saṅkhya '2' of the corresponding 2nd LEP-proxy, '2' Laghus as per the SM-figure (1+1=) '2' of the corresponding 2nd LEP-proxy and '2' Drutas as per the SM-figure (1+1=) '2' of the corresponding 1st DEP-proxy of the immediate lower-line; '1' Druta lying in the right extreme end of the first DEP out of the '2' DEPs as per the Saṅkhya '2' of the corresponding 1st DEP-proxy of the immediate lower-line and '1' Guru as per the Saṅkhya '1' of the corresponding 4th GEP-proxy --- thus totalling to (4L+1G+1D+2L+2L+ 2D+1D+1G=) '14' Aṅgas.

The table and diagram of the above analysis are furnished here.



**RELEVANT OLD SANSKRIT TEXTS FOLLOWED BY FREE
ENGLISH TRANSLATION**

Note : Each foot of each Ślōka is divided into two halves and thus the four halves of each Ślōka are named as 'A, B, C & D'.

**5.1. Sanskrit Text of Tālaprastāra from
Saṅgīta Ratnākara of Niḥśaṅka Śārṅgadēva
(Tāḷādhyāya : Ślōkas 312 - 408)**

संगीतरत्नाकरः

अन्येऽपि सनति भूयांसस्तालास्ते लक्ष्यवर्त्मनि । प्रसिध्दिविधुरत्वेन शास्त्रेऽस्मिन्नप्रदर्शिताः ॥	(1)	तालभेदाः ऋमादङ्कैः संख्यायन्ते स्थितैरिह । यदङ्कयोगादन्त्योऽङ्को लब्धस्तैरन्ततः क्रमात् ॥	(11)
तद्भेदप्रत्ययार्थं तु लघूपाया भवन्त्यामी । प्रस्तारसंख्ये नष्टं चोद्दिष्टं पातालकास्ततः ॥	(2)	भेदा द्रुतान्तलध्वन्तगुर्वन्ताश्च प्लुतान्तकाः । संख्यायन्त इति प्रोक्ताः संख्या निःशङ्कसूरिणा ॥	(12)
द्रुतमेरुर्लघोर्मेरुर्गुरुमेरुः प्लुतस्य च । मेरुः संयोगमेरुश्च खण्डप्रस्तारकस्ततः ॥	(3)	अत्रैतावितिथो भेदः किंरूप इति पृच्छति । यत्र तत्रष्टमाख्यातं तस्योत्तरमिहोच्यते ॥	(13)
प्राचां चतुर्णां मेरुणां नष्टोद्दिष्टे पृथक्पृथक् । एकोनविंशतिरिति प्रत्ययास्तान् ब्रुवेऽधुना ॥	(4)	भेदानां यावतां मध्ये नष्टप्रश्नः कृतो भवेत् । तावत्संख्याङ्कपर्यन्तां लिखेत्संख्याङ्कसंततिम् ॥	(14)
न्यस्याल्पमाद्यान्महतोऽधस्ताच्छेषं यथोपरि । प्रगूने वामसंस्थास्तु संभवे महतो लिखेत् ॥	(5)	अन्याङ्के तत्र नष्टाङ्कं पातयोदथ शेषतः । पातयोत्पूर्वाङ्कं तत्र त्वपतितो द्रुतः ॥	(15)
अल्पानसंभवे तालपूर्वो भूयोऽप्ययं विधिः । सर्वद्रुतावधिः कार्यः प्रस्तारोऽयं लघौ गुरौ ॥	(6)	पूर्वश्चेत्पतितो न स्याल्लघुस्तु पतिताद्भवेत् । उत्तरेणाकृतार्थेन सहितात्तदसंभवे ॥	(16)
प्लुते व्यस्ते समस्ते च न तु व्यस्ते द्रुतेऽसित सः । एकद्वयङ्कौ क्रमात्त्रयस्य युञ्जीतान्यं पुरातनैः ॥	(7)	अकृतार्थेन पूर्वेण सान्तरे पतिते पृथक् । लघुर्निरन्तरे त्वस्मिँल्लघुरेव गुरुर्भवेत् ॥	(17)
द्वितीयतुर्यष्टाङ्कैरभावे तुर्यषष्टयोः । तृतीयपञ्चमाङ्काभ्यां क्रमात्तं योगमग्रतः ॥	(8)	गुरुहेतोस्तृतीये तु पतिते गः प्लुती भवेत् । अङ्काभावे द्रुता ग्रह्यास्तालपूरणहेतवः ॥	(18)
लिखेद्दक्षिणासंश्वैवमङ्कश्रेणी विधीयते । सा चाङ्कैरिष्टतालस्थद्रुतासंख्यैः समाप्यते ॥	(9)	इति नष्टस्य विज्ञेयमुत्तरं रूपनिर्णयात् । ईदृगूपोऽत्र कतिधा भेदः प्रश्न इतीदृशः ॥	(19)
द्रुतो लघुः सार्धमात्रो गुरुः सार्धद्विमात्रिकः । प्लुतः सार्धत्रिमात्रश्वेत्येकैकद्रुतवर्धितैः ॥	(10)	उद्दिष्टं तत्र संख्याङ्कसंततिं नष्टवल्लिखेत । यैरङ्कैः पतितैर्नष्टे लभ्यन्ते ये प्लुतादयः ॥	(20)

- तानेङ्काल्लभन्ते ते भदमुद्दिष्ट माश्रिताः ।
यद्वा षट्प्लुतहेत्वङ्कमध्ये ऽन्यात्प्राचि सप्तम ॥ (21)
- तदभावे तु षष्ठाङ्केपातितेऽनत्याङ्कमध्यतः ।
यः शेषः स प्लुताल्लभ्यो लब्धहीनान्त्यशेषतः ॥ (22)
- ज्ञानं पूरणसंख्याया उद्दिष्टोत्तर मिष्यते ।
आदौ रूपमथैकैकमङ्कसंख्याङ्कसंततेः ॥ (23)
- क्रमादधोऽधो विन्यस्येदन्त्यादींश्चतुरस्ताथा ।
स्वपङ्क्तिस्थाँ ल्लिखेदङ्कानग्रसंख्याङ्कवद्युतान् ॥ (24)
- किंतु प्रतिनिधिर्नात्र विद्यते तुर्यषष्ठयोः ।
इष्टतालद्रुतमितेष्वङ्केषु लिखितेष्विति ॥ (25)
- क्रमादन्तयोपान्त्यतुर्यषष्ठैर्यत्र द्रुतादयः ।
मीयन्ते सर्वभेदस्याः पातालः सोऽभिधीयते ॥ (26)
- पङ्क्ति कृत्वेष्टतालस्यद्रुतसंमितकोष्टिकाम् ।
तीरर्शीं तत्परामूनां कोष्ठेनाथ ततः पराः ॥ (27)
- द्विद्विकोष्ठोनिताः स्वस्वपूर्वतोऽथाङ्कयोजना ।
द्वौ द्वौ तासामाद्योकोष्ठौ स्यातामेकाङ्कसंयुतौ ॥ (28)
- अधस्तन्यास्तुतीयादौ विषमे कोष्ठके लिखेत् ।
अन्त्याद्यङ्कचतुष्कस्य योगं संख्याङ्कसंघवत् ॥ (29)
- समे त्वन्त्यं विनैतेषां योगं न्यस्याथ पङ्क्तिषु ।
परासु शेषकोष्ठेषु चतुर्योगोऽयमिष्यते ॥ (30)
- नास्ति प्रतिनिधिस्त्वासामङ्कयोस्तुर्यषष्ठयोः ।
तासु स्वभावतो यास्तु निष्पन्न ऊर्ध्वपङ्क्तयः ॥ (31)
- तन्मध्ये तु समा कोष्ठेऽन्त्यस्थानेऽन्यादघस्तनः ।
अङ्कः कार्योऽथ तैरङ्कैर्भेदसंख्याभिधीयते ॥ (32)
- विषमायामूर्ध्वपङ्क्तौ स्थितैरङ्कैरथः क्रमात् ।
एकद्रुताद्या विषमत्र्यादिसंख्या द्रुता भिदाः ॥ (33)
- सर्वद्रुतान्ता मीयन्ते समपङ्क्तिस्थितैः पुनः ।
द्रुतहीनादयो द्व्यदिसमसंख्या द्रुता भिदाः ॥ (34)
- सर्वद्रुतान्ता ज्ञायन्ते द्रुतमेरुशं मत ।
ऊर्ध्वपङ्क्तिस्थर्वाङ्कयोगात्संख्यापि गम्यते ॥ (35)
- लघुमेरौ कोष्ठपङ्क्तीः प्रग्वन्त्यस्येत्तदादिमः ।
एकैककोष्ठ एकाङ्कयुक्तोऽधः पङ्क्तिकेषु तु ॥ (36)
- शेषकोष्ठेष्वन्त्यतुर्यषष्ठयोगं निवेशयेत् ।
परासां शेषकोष्ठेषूपान्त्याधस्तनसयुतम् ॥ (37)
- त्रियोग मेवमादध्यादत्र च द्रुतमेरुवत् ।
सदसत्वे प्रतिनिधेः कोष्ठाङ्केरुर्ध्वपङ्क्तिगैः ॥ (38)
- लघुहीनादुपक्रम्यै कोष्ठेकोत्तर वृद्धलाः ।
सर्वलान्ताः क्रमाज्ञेयाः संख्या सर्वाङ्कसंगतेः ॥ (39)
- गुरुमेरावधःपङ्क्तेः परा कोष्ठत्रयोनिता ।
चतुश्चतुष्कोष्ठहीनाः स्वस्वपूर्वावलेः पराः ॥ (40)
- एकाङ्कवन्त आद्याद्यकोष्ठाः प्रथमपङ्क्तिगः ।
द्वितीयो द्व्यङ्कवानन्त्योपान्त्यषष्ठाङ्कयोगिनः ॥ (41)
- शेषकोष्ठाः परासां तु द्वितीयादिषु लिख्यते ।
योगोऽन्त्योपान्त्यषष्ठानामधस्तुर्याङ्कसंयुतः ॥ (42)
- लघुस्थाने गुरुर्ज्ञेयः शेषं तु लघुमेरुवत् ।
प्लुतमेरावधः पङ्क्तेः पञ्चकोष्ठोनिता परा ॥ (43)
- तत्पराः स्वस्वपूर्वातः षट्पङ्क्तिकोष्ठोनिता मताः ।
अधः पङ्क्तौ तु षष्ठाङ्कस्थाने तुर्यं नियोजयेत् ॥ (44)
- त्रियोगोऽयमधः षष्ठयुक्तः स्यात्परपङ्क्तिषु ।
प्लुतो ज्ञेयो गुरुस्थाने शेषं तु गुरुमेरुवत् ॥ (45)
- संयोगमेरावूर्ध्वाः स्युश्चतस्रः कोष्ठपङ्क्तयः ।
इष्टतालद्रुतमितैः कोष्ठैर्युक्तास्ततः परे ॥ (46)
- द्वे पङ्क्ती स्वस्वपूर्वातो द्विद्विकोष्ठोनिते ततः ।
द्वे षष्ठ्या एककोष्ठोने ततस्तिस्त्रोऽष्टमावलेः ॥ (47)
- एककोष्ठोनिताः पश्चाद् द्विद्विकोष्ठोनिते परे ।
पङ्क्तिभ्यां स्वस्वपूर्वाभ्यां तथैकैकोनिते परे ॥ (48)
- आद्यासु चतसृष्वासां क्रमेण सकलद्रुताः ।
समस्तलघवः सर्वगुरवः सकलप्लुताः ॥ (49)
- एकाङ्कयुक्तनिःशेषकोष्ठाद्या स्यात्परा पुनः ।
खयुक्तैर्विषमैः कोष्ठैः समैस्त्वेकाङ्कसंयुतैः ॥ (50)

- कर्तव्या गुरुपङ्क्तेस्तु त्रयः कोष्ठा नभोन्विताः।
तुर्य एकाङ्कवानेवं चतुष्कोष्ठाः परा अपि॥ (51)
- प्लुतपङ्क्तौ सशून्या स्युः पञ्च षष्ठस्तु रूपवान् ।
षट्कोष्ठास्तद्वदन्ये स्युः षट्सुपङ्क्तिघनन्तरम् ॥ (52)
- द्वियोगजाः क्रमाभेदा दलघू दगुरू दपौ ।
लगौ लपौ गपौ चेती तदङ्कप्रक्रिया त्वियम् ॥ (53)
- अत्रोपरिष्ठादारभ्य श्यादधोऽधोऽङ्कलेखनम् ।
अन्त्यपूर्वद्वितीयाङ्कतुर्यषष्ठास्तया क्मात् ॥ (54)
- योज्या दलगपेषु स्युस्तेषु तद्योगजा भिदाः ।
पङ्क्तौ तदङ्कयोगाङ्कं तत्कोष्ठे संभवौल्लिखेत् ॥ (55)
- लेख्यपङ्क्त्युपरिश्रेणीया तिरश्ची तदाश्रिताः ।
अङ्क दलगपानां स्युराद्यपङ्क्तिचतुष्टये ॥ (56)
- तेषु प्रस्तुत भेदस्यद्रुतादिव्यक्ति संश्रितान् ।
अङ्कानुहृणीत तेऽप्यन्त्यद्वितीयाद्या द्रुतादिषु ॥ (57)
- प्रस्तुतेषु विपर्यस्ताःस्युङ्कासंभवे तु खम् ।
त्रियोगजाश्च ये भेदाश्चतुर्योगभवश्च यः ॥ (58)
- तत्पङ्क्तीनामपि ज्ञायमेवमेवाङ्कपूरणम् ।
किंतु त्रियोगजे भेदे ये त्रयः स्युर्द्वियोगजाः ॥ (59)
- तेषां संनिहिताद्यानां प्रागुक्तोऽङ्कविपर्ययः ।
चदुर्योगे तु चत्वारो ये स्युर्भेदास्त्रियोगजाः ॥ (60)
- तदङ्कष्वेव पूर्वोक्तं स्याद्विपर्यासयोजनम् ।
ये चत्वारस्त्रियोगोत्थश्चतुर्योगोत्थपञ्चमाः ॥ (61)
- भेदास्ते पङ्क्तिषु ज्ञेयाः क्रमादन्त्यासु पङ्क्तिषु ।
दलगा दलपाश्चैव दगपा लगपाः क्रमात् ॥ (62)
- त्रियोगजाश्चतुर्योगोभवा दलगपा इति ।
एष संयोगमेरुः स्यादतो ज्ञेयमथोच्यते ॥ (63)
- तिर्यक्पङ्क्तिस्थकोष्ठाङ्कैस्तैः सर्वद्रुतादयः।
उर्ध्वपङ्क्तिगता मेयास्तदभावस्तु शून्यतः ॥ (64)
- तावद् द्रुतोऽत्र तालः स्यात्पङ्क्तिर्यावतिथी तिरः ।
उपरिष्ठात्समारभ्य संख्या पङ्क्त्यङ्कसंगतेः ॥ (65)
- द्रुतहीनादयो भेदोद्धारा ये मेरुबोधिताः ।
सर्वप्रस्तारवत्तेषां प्रस्तारः किं तु तेषु यः ॥ (66)
- द्रुतादिनियमः सोऽत्र न भङ्क्तव्यः प्रयत्नतः ।
संख्येषा मेरुकोष्ठाङ्काद्यस्मात्पूर्वोक्तरीतितः ॥ (67)
- लभ्यते तत्र नष्टाङ्कं पातयेदथ शेषतः ।
तृतीयपञ्चमोपान्त्यावपाते लभ्यते लघुः ॥ (68)
- परो यद्यकृतार्थः स्यात्सह तेनाथ चेदुभौ ।
अकृतार्थो ततस्ताभ्यां स्वं विनैवैष लभ्यते ॥ (69)
- परे कृतार्थे ग्राह्यः स्यादकृतार्थः पुरातनः ।
पतिताद् गुरुलाभः स्यात्सह प्राचा तदा परा ॥ (70)
- चतुरङ्की निवर्तेत पतिते पञ्चमेऽप्यथ ।
गुरुः प्लुती भवेत्प्राचा सह चैषा निवर्तते ॥ (71)
- रूपाप्तौ प्रापकाङ्केभ्यः शेषेष्वेष पुनर्विधिः ।
गुरुलाभे त्वपातार्हः पञ्चमः शेषतां ब्रजेत् ॥ (72)
- अङ्काभावे तु गुह्यान्ते लघवस्ताल पूर्वये ।
उद्दिष्टे तु गुरोर्लभ्यस्तृतीयोऽन्त्यतूपुरातनः ॥ (73)
- प्राग्वच्चतुर्निवृत्तिः स्यात्तृतीयः पञ्चमस्तथा ।
प्लुताल्लभ्यो निवृत्तिस्तु षण्णामथ पुनर्विधिः ॥ (74)
- लघोरङ्को न लभ्येत निवृत्तिस्त्वङ्कयोर्द्वयोः ।
लब्धाङ्कयोगीनेऽन्त्ये शेषादुद्दिष्टबोधनम् ॥ (75)
- समस्तनष्टवन्नष्टं विषमे कोष्ठके भवेत् ।
द्रुते लब्धे ततः पूर्वैरङ्कैः स्यात्समकोष्ठवत् ॥ (76)
- समस्तोद्दिष्टवत्प्रोक्तमुद्दिष्टमिह सूरिभिः ।
द्रुताङ्कानन्तरं कार्यं विधानं समकोष्ठवत् ॥ (77)
- कोष्ठे समोर्ध्वपङ्क्तिस्थे परासामधिको भवेत् ।
द्वितीयाधस्तनः पात्यस्तत्र त्वपतिताद् द्रुतः ॥ (78)
- पतिताल्लः पात्यपातानन्तर्येऽल्पो महान्भवेत् ।
रूपपूर्ते निवर्तन्ते पूर्ववत्स्वीयपङ्क्तिगाः ॥ (79)
- अधः समवदन्यस्यान्निवृत्तौ तु पुनर्विधिः ।
यस्मात्स यस्यामूर्ध्वायां पङ्क्तौ सा विषमा यदि॥ (80)

- विधिर्विषमकेष्टोक्तः समा चेत्तर्ह्यायं मतः ।
विषमोर्ध्वश्रेणिसंस्थे कोष्टेऽधोविषमोदितः ॥ (81)
- यैरङ्कै पतितैर्नष्टैर्लभ्यन्ते ये प्लुतादयः ।
तेभ्य उद्दिष्टसंस्थेभ्यस्तदङ्कावाप्तिरिष्यते ॥ (82)
- द्रुतहीनद्यकोष्ठासु पङ्क्ति षूर्ध्वासु यो लघुः ।
तस्माद्दुद्दिष्ट रूपस्थानाङ्कः कश्चिदवाप्यते ॥ (83)
- लब्धाङ्कान्यूनितान्यङ्करोषादुद्दिष्ट वेदनम् ।
लघुमेरावधःपङ्क्तेर्नष्टाङ्केनान्यशेषतः ॥ (84)
- पूर्वेषौ पात्यमानानामपाते पुर्ववद् द्रुतः ।
पतितात्सह पूर्वाभ्यां परेण च गुरुभवेत् ॥ (85)
- पतिते वृत्तगुर्वङ्कानन्तरे गः प्लुती भवेत् ।
एवं नष्टस्य बोधः स्यादित्युक्तं सूरिशङ्किणा ॥ (86)
- नष्टे तु परपङ्क्तीनां पातयेत्प्रातिलोभ्यतः ।
द्वितीयं च तृतीयाधस्तनमङ्कं च पञ्चमम् ॥ (87)
- पुरेषु च निवृत्तेशु शेषेषु पुनर्विधिः
समस्तनष्टवच्चात्र द्रुतादेः प्राप्तिरिष्यते ॥ (88)
- किंतु लब्धे लघौ शेषेष्वध्याधस्तनतः क्रिया ।
सोऽधस्तनः स्वपङ्क्तिस्थविधिमेवं प्रवर्तयेत् ॥ (89)
- शेषेऽङ्कश्रितपङ्क्त्यङ्काभावे तु लघवो मताः ।
अधस्तनश्रेणिसंख्या नष्टस्यैष विधिः स्मृतः ॥ (90)
- गुरु मेरोरधः पङ्क्तौ नष्टं सकलनष्टवत् ।
प्लुतलाभस्तु गुरु वत् परपङ्क्तिष्वयोच्यते ॥ (91)
- तृतीयाधस्तनस्थाने तृतीयोऽङ्कोऽत्र पात्यते ।
स्थाने तु पञ्चमस्याधः पञ्चमो लघुवद्गुरौ ॥ (92)
- लब्धेऽधोव्रजनं शेषाल्लघुवद्गुरुलम्भनम् ।
लघुमेरुवदन्यतु नष्टे स्यात्परपङ्क्तिषु ॥ (93)
- समस्तनष्वत्रष्टं प्लुतमेरावुदाहृतम् ।
विशेषः कथ्यते त्वेष द्वितीयादिषु पङ्क्तिषु ॥ (94)
- अधो गच्छेत् प्लुते पूर्णो गुरुमेरौ गुराविव ।
द्रुतो लघुर्गुरुर्वान्त्यैरङ्कैर्लब्धः प्लुती भवेत् ॥ (95)
- तदङ्कधस्तनैः साधामङ्कषट्कमतीत्य च ।
अधः पङ्क्तौ स्थितैरङ्कैः शेषैरेष पुनर्विधिः ॥ (96)
- पङ्क्तौ तु प्लुतहीनायां नान्तिमः प्लुततां व्रजेत् ।
सर्वोद्दिष्टवदुद्दिष्टं लघुमेवादिषु त्रिषु ॥ (97)

5.1.1. FREE ENGLISH TRANSLATION

- 1-4 : In practical music there are many other Tālas. As they are not in vogue they have not been described in this Śāstra. These are the easy methods to know their varieties of those Tālas. They are nineteen : Prastāra, Saṅkhyā, Naṣṭa, Uddiṣṭa, Pātāḷa, Druta-mēru, Laghu-mēru, Guru-mēru, Pluta-mēru, Saṁyōga-mēru, Khaṇḍa-prastāra, Naṣṭa and Uddiṣṭa of the four-mērus. I shall now, define them.

PRASTĀRA

- 5-7B : Place the lower (aṅga) below the higher (aṅga). Write the remaining in the same way. If the Tāḷa-units are lesser than the previous and if the lower Aṅgas are suitable, write them to the left. If not, to fill-in the Tāḷa, write lower Aṅgas. This should be done till all become Drutas. This is the permutation in regard to Laghu, Guru and Pluta and their mutual combinations but not for Druta.

SAṆKHYA

- 7C-12 : Write figures 1 & 2 consecutively. Add the previous (ultimate), previous second (penultimate), fourth and sixth. If fourth and sixth are absent add the 3rd and 5th (pratinidhi) instead. Write the total figures continuously to the right. This (series) ends with the (number of) Drutas (equivalent in total duration) of the required Tāḷa. The series should proceed by gradually increasing by one Druta : eg., Druta, Laghu, Mātra and a half, Guru, two Mātras and a half, Pluta, three Mātras and a half. The varieties of Tāḷas are enumerated by these figures of Saṅkhyā. Among the figures which add upto the total figure of Tāḷa varieties (Saṅkhyā), those figures reckoned serially from the right give the number of Tāḷas ending in Druta (DEP), Laghu (LEP), Guru (GEP) and Pluta (PEP) respectively.

NAṢṬA

- 13-19B : If it is asked : 'what form does Tāḷa bearing a particular number (in the Prastāra scheme) consist?' - the answer is given by Naṣṭa; (this is determined) by writing the series of figures of Saṅkhyā, upto the number of Drutas which are equivalent to the quantity of the Tāḷa. The Naṣṭa-number is subtracted from the final figure; from the remainder, subtract the preceding figures. If not subtractable, write Druta; if the figure is not thus subtractable but subtracted either along with the un-deducted figure on the right or on the left, write Laghu. If subtracted alternatively or discontinuously write Laghus separately. If subtracted consecutively, this Laghu becomes Guru. If the third from the figure giving out Guru is also subtracted, this Guru becomes Pluta. In the absence of subtractable numbers fill-in the deficit of the Tāḷa amount by writing the appropriate number of Drutas. Thus the form of the desired Tāḷa is known.

UDDIṢṬA

- 19C-23B : Whatever the Pluta (-ending Tāḷas) etc., are obtained by subtracting whatever figures the self-same figures give the Uddiṣṭa (forms) also. For example, the serial number of the Uddiṣṭa (desired) Tāḷa is as the remainder obtained when from the final figure the penultimate, the seventh or in its absence, the sixth figure are deducted.

PĀTĀLA

- 23C-26 : First write '1' in the first house, below Saṅkhyā, and other figures one after the other in the later houses. Write the upper figure of the previous figure including the last four figures beginning with the last in the present line. The difference (from Uddiṣṭa) is in this case the pratinidhis 3rd & 5th, should not be taken if the 4th & 6th figures are absent. Like this the figures should be written upto the total number of Drutas equal to the quantity of the Tāḷa and in this process the total of the ultimate, penultimate, fourth and sixth is written it is called Pātāḷa.

DRUTA-MĒRU

- 27-35 : Write houses horizontally upto the number of Drutas equal in quantity to the required Tāḷa. Above it write another horizontal line with one house less. Then write further upper lines each with two houses lesser than its predecessor. In the houses prepared in the above manner, write figures as mentioned below. In the first two houses of all these lines write the figure '1'. In the odd-numbered houses of the lowest-line write the total of the four figures

viz., ultimate etc., as in the Saṅkhya and in the even-numbered houses write the total omitting the ultimate. In the remaining houses of the upper-lines the total of the four should be written. For the upper-lines the 'pratinidhi' of 4th & 6th houses should not be used. For the even-numbered houses of the upper-lines, instead of the ultimate, the lower figures of the ultimate should be written. From the figures of the upper-lines, the number of varieties of the prastāras could be furnished. In the odd vertical lines, serially from bottom, varieties consisting of odd-numbers of Drutas, like one-Druta, along with Sarva-Drutānta (ADEPs) in the end, are written and in the even-lines, varieties consisting of zero-Drutas and even-number of Drutas, like 2-Drutas, along with Sarva-Drutānta in the end, are written. This is the method of Druta-mēru. Also by totalling of all these figures of these vertical lines, the Saṅkhya could be obtained.

LAGHU-MĒRU

- 36 - 39 : Keep the lines of houses of Laghu-mēru as in Druta-mēru and write '1' in the first houses. Write the total of the ultimate, fourth and sixth houses in the remaining houses of the lowest line. Add the lower figure of the penultimate to the triplet of the remaining houses of the upper-lines. Here also the 'pratinidhi' effects are as in Druta-mēru. The figures of the vertical lines should be understood serially starting from the varieties of zero-Laghu, one-Laghu varieties in gradually increasing order of Laghus upto Sarva-laghvantas (ALEPs). The total of all the figures form Saṅkhya.

GURU-MĒRU

- 40-43B : In Guru - mēru write the second line with three houses lesser than the lowest-line and its upper-lines, four houses lesser than the precedent ones. Write '1' in the first houses. Second house of the first line should consist of '2' and the remaining the total of the ultimate, penultimate and sixth. From the second upper-line add the lower of the fourth to this total of the ultimate, penultimate and sixth. In place of Laghu keep Guru. The rest is as in Laghu-mēru.

PLUTA-MĒRU

- 43C - 45 : In Pluta-mēru write the second line with five houses lesser than the lowest line and its upper-lines six houses lesser than their previous ones. In the lowest line in place of 6th take the 4th. The upper-lines include the lower of the sixth with the triplet. In place of Guru keep Pluta. The rest is as in Guru-mēru.

SAMYŌGA-MĒRU

- 46-65 : In Saṁyōga-mēru, the four vertical lines consist of houses upto the requirement of Drutas. Next two lines are of two houses lesser than their predecessors. Next two lines have one house lesser than the sixth. Next three lines have one lesser than the eighth. Next two lines have two houses less. Next two lines have one house lesser than their predecessors. Among them, the first four lines are of the varieties of Sarva-drutāntas (ADEPs), Sarva-laghvantas (ALEPs), Sarva-gurvantas (AGEPs) and Sarva-plutāntas (APEPs) respectively. First line has the number '1' in all houses, next line is of 'O' in odd-houses and '1' in even-houses. In Guru-line three houses have 'O', 4th has '1' and in the same manner in each of the four houses later. In Pluta-line five houses have 'O', 6th has '1' and in the same manner in the next six houses. The next six lines are of the duplets of DL, DG, DP, LG, LP and GP. This

is the way of writing figures. Here figures are written starting from top to bottom. In respect of D, L, G and Ps ultimate, penultimate, 4th & 6th are taken respectively. The total of the figures of the respective combinations are to be written. The figures of the respective D, L, G & Ps of first four of the upper horizontal lines should be taken into account. In respect of ultimate, penultimate etc., of Druta etc., the above figures are in reverse order. Write 'O' if no figures are existing. The figures for the lines of triplets derived out of the quadruplets are also written in the same manner. For the three duplets, derived out of the triplets and which begin from the nearest figure, the above reverse order is followed. Only for the figure of the four triplets derived out of the quadruplets the above reverse order is to be followed. In the last five lines the four triplets and the fifth quadruplet are DLG, DLP, DGP, LGP and DLGP. This is called Saṃyōga mēru and later the thing to be known is mentioned. By the figures of the horizontal lines pertaining to the vertical lines of Sarva-drutāntas (ADEPs), Sarva-laghvantas (ALEPs) etc., the varieties should be known and their absence by 'O'. In this table the serial number of the horizontal line is the value of Drutā of that Tāḷa. Starting from the above the total of the numbers of all the lines is Saṅkhya.

KHAṆḌA-PRASTĀRA

66 - 67B : Even for the varieties lacking Druta mentioned in Druta-mēru etc., the prastāra is same, but prastāra should be made without violating the restrictions of Druta etc.

DRUTA-MĒRU-NAṢṬĪDDIṢṬA

67C-73B : Lowest-line-even-number-Naṣṭa : The question number is subtracted from the Saṅkhya which is formed from particular mēru figures. Then, from the remainder, the 3rd, 5th and the penultimate should be subtracted. If it is not subtractable Laghu is obtained. If the next figure is not subtractable, or including it, if the next two figures are not subtracted, even without them, Laghu is obtained. If the next figure is subtracted, the un-deducted ultimate should be taken into account. Guru is obtained from the subtracted figure. Then, including the ultimate, the next four figures should be left-off. If the fifth is also subtracted the Guru becomes Pluta. This figure including the ultimate should be omitted. If Aṅgas like Laghu are obtained from the figures, the same method should be repeated in respect of the remaining figures. If Guru is obtained the un-deductible fifth becomes the remainder. In the absence of the figures Laghus should be written to fill-in the deficit of Tāḷa.

73C - 75 : Lowest - line - even - number -uddiṣṭa : In Uddiṣṭa, from Guru, the 3rd figure of the ultimate is obtained and four figures should be omitted as above. From Pluta, the 3rd and 5th figures are obtained and six figures should be omitted. Follow as above in respect of the remaining figures. From Laghu, no figure is obtained but two figures should be omitted. By subtracting the total of the obtained figures from the remainder, the Uddiṣṭa should be answered.

76 : Lowest-line-odd-number-naṣṭa : For odd-houses the Naṣṭa is as above. Druta is obtained from the ultimate figure as in Naṣṭa of even - houses.

77 : Lowest-line-odd-number-uddiṣṭa : For Uddiṣṭa, proceed as above. After obtaining the figure from Druta proceed as in Uddiṣṭa of even-houses.

78-81 : Upper-lines-Naṣṭa : For the even-houses of the upper-lines the lower of the 2nd should also be subtracted in addition. Druta is obtained from the undeducted figure and Laghu

from the deducted. If figures are subtracted discontinuously the lower ones become higher ones. After obtaining Laghu etc., the figures of the same line should be omitted as above. The rest is as for the even-houses of the lowest-line. After leaving the figures the procedure should be started again as prescribed for the odd houses or the even houses. For odd houses of upper-lines follow as for the odd houses of the lowest-line.

- 82-84B : Upper-lines-uddiṣṭa : Pluta etc., are obtained in Uddiṣṭa from the very same figures by subtracting which Pluta etc., are obtained in Naṣṭa. Where there is Laghu in the vertical lines, in which zero Drutas are in the first house, from that Laghu no figure could be obtained. By subtracting the total of the obtained figures from the remainder, the Uddiṣṭa should be derived.

LAGHU-MĒRU-NAṢṬA

- 84C - 90 : For the lowest-line of Laghu-mēru, Druta is obtained from the remainder as above from the un-deductible preceding figures, after deducting the question-number from the final figure. By subtraction of two previous figures and one upper figure, Guru is obtained. If the alternative figure of the figure giving out Guru, is also subtracted, the Guru becomes Pluta. In this manner the Naṣṭa should be understood as told by Śārṅgadēva. For the Naṣṭa of the upper - lines the 2nd, the lower of the 3rd and the 5th should be subtracted in reverse order. After the upper figures are disposed off, the previous method should be followed in respect of the remaining figures. Here, as in general Naṣṭa, Drutas etc., are obtained. But, while Laghu is obtained in respect of other Aṅgas, it should be followed starting from the lower figure of the first. That lower figure should be followed as preferred for self-line. In the absence of the figure of the line, the Laghus, equal with the number of the lower-lines should be taken. This is for Naṣṭa.

GURU-MĒRU-NAṢṬA

- 91-93 : The Naṣṭa for the lowest-line of Guru-mēru is as in general Naṣṭa. Pluta is obtained like Guru-mēru. The procedure in respect of the upper-lines will now be described. Here, in place of the lower of the 3rd, the 3rd should be subtracted, and in place of the 5th, the lower of the 5th should be subtracted. Like Laghu, if Guru is obtained, same procedure should be adopted as in the lowest-line. Guru is obtained like Laghu. In Naṣṭa of upper-lines the rest is as in Laghu-mēru.

PLUTA-MĒRU-NAṢṬA

- 94-97B : Pluta-mēru Naṣṭa is as in general Naṣṭa. For the 2nd and further upper-lines a difference should be noted. As it is done after obtaining Guru for Guru-mēru, in this table, after obtaining Pluta, the same procedure should be followed as in the lowest-line. Either Druta, Laghu or Guru, obtained from the last figure, becomes Pluta. The process should be repeated with the figures of the lowest-line after omitting six figures of the lowest-line of the ultimate figure. No ultimate figure of the lowest Pluta-devoid-line becomes Pluta.

UDDIṢṬA OF OTHER MĒRUS

- 97C & D : The general Uddiṣṭa should be followed for the Uddiṣṭa of the three tables (mērus) of Laghu etc.

**5.2. Sanskrit text of Tālaprastāra from
Nartananirṇaya written by Paṇḍarika Viṭṭhala
(Tālaprakaraṇa :- Ślōkas 196 - 231)**

नर्तवनिर्णय

- अन्येन दशितास्ताला ग्रन्थविस्तरभिरूणा ।
तभ्देदज्ञापकोपायाश्चत्वारस्तान् ब्रुवेऽधुना ॥ (1)
- प्रस्तार संख्ये नष्टं चोद्दिष्टं चेत्यथ लक्षणम् ।
न्यस्याल्पमाद्यान् महतोऽथस्तात् शेषं यथोपरि ॥ (2)
- प्रगूने वामसंस्थांस्तु सम्भवे महतो लिखेत् ।
अल्पानसम्भवे तालपूर्त्यै भूयोऽप्ययं विधिः ॥ (3)
- सर्वद्रुतावधिः कार्यः प्रस्तारोऽयं लघौ गुरौ ।
प्लुतो व्यस्ते समस्ते च न तु व्यस्ते द्रुते ऽस्ति सः ॥(4)
- ननु त्वया दलगपैः प्रस्तारोऽत्र दर्शितः ।
विरामादिस्वरूपस्य प्रस्तारः किंनलक्षितः ॥ (5)
- ब्रूमो विश्रान्तिरूपस्य विरामस्य भवेद्यदि ।
प्रस्तारादिकमेतद्वलपान्तं तत्प्रसज्यते ॥ (6)
- तत्स्वाकारेत्वतियप्या शास्त्रं व्याकुलितं भवेत् ।
अतो विरामसहित प्रस्तारादिकथा वृथा ॥ (7)
- एकद्रुयङ्कौ क्रमान्यस्य युञ्जीतान्यं पुरातनैः ।
द्वितीयतुर्यषष्ठाङ्कैरभावे तुर्य षष्ठयोः ॥ (8)
- तृतीय पञ्जमाङ्काभ्यां क्रमात्तं योगामग्रतः ।
लिखेद्दक्षिणसंस्थैवमङ्कश्रेणीविधियते ॥ (9)
- साचाङ्कैरिष्टतालस्थ द्रुतसंख्यैस्समाप्यते ।
द्रुतो लघुः सार्थमात्रो गुरुः सार्याद्विमात्रिकः ॥ (10)
- प्लुतः सार्थत्रिमात्रश्चत्येकैक द्रुतवर्धितैः ।
तालभेदाः क्रमादङ्कैः संख्यायन्ते स्थितैरिह ॥ (11)
- यदङ्कयोगादन्योऽङ्कौलब्धस्थैरन्ततः क्रमात् ।
भेदा द्रुतान्ता लध्वान्ता गुरन्ताश्च प्लुतान्तकाः ॥ (12)
- संख्यायन्त इति प्रेक्ता संख्या निश्राङ्कसूरिणा ।
अत्रैतावतिथो भेदः किं रूप इति पृच्छति ॥ (13)
- यत्र तन्नष्टमाख्यातं तस्योत्तरमिहोच्यते ।
भेदानां यावतां मध्ये नष्टप्रश्नः कृतो भवेत् ॥ (14)
- कानत्संख्याङ्कपर्यन्तां लिखेत् संख्याङ्कसन्ततिम् ।
अन्याङ्के तत्र नष्टाङ्कं पातयेदथ शेषतः ॥ (15)
- पातयेत्पूर्वपूर्ववडिकं तत्रत्वपतितोद्भुतः ।
पूर्वश्चेत्यतितो न स्याल्लघुस्तु पतिताद्भवेत् ॥ (16)
- उत्तरेणाकृतार्थेन सहितात्तदसम्भवे ।
अकृतार्थेन पूर्वेण सान्तरे पतिते पृथक् ॥ (17)
- लघुर्निरन्तरेत्वस्मिन् लघुरेव गुरुर्भवेत् ।
गुरुहेतोस्तृतीये तु पतितेगः प्लुती भवेत् ॥ (18)
- अङ्काऽभावे द्रुताग्राह्यास्तालपूरणहेतवः ।
इति नष्टस्य विज्ञेयमुत्तरं रूपनिर्णयात् ॥ (19)
- ईदृगूपोऽत्र कतिथो भेदो यत्र इतीरितः ।
उद्दिष्टं तत्र सख्याङ्कसन्ततिं नष्टवल्लिखेत् ॥ (20)
- यैरङ्कैः पतितैर्नष्टे लभ्यन्ते ये प्लुतादयः ।
तानेवाङ्कान् सामादाय त्वन्यङ्के पातयेत्ततः ॥ (21)
- अङ्काःस्युर्गवशिष्टा येतेभ्य उद्दिष्टसाधनम् ।
तालव्यत्यय प्रस्तारेऽथोऽथो दलगपान् क्रमात् ॥ (22)
- न्यसेत् वामेतदूर्ध्वस्थान् दक्षिणो द्रुतपूरणम् ।
किन्तु सव्यत एकैकं त्यक्त्वा प्रस्तारयेत् क्रमात् ॥ (23)
- नष्टोद्दिष्टं कथं ज्ञेयं प्रस्तारेऽत्र विपर्यये ।
प्रश्नाङ्कैरेव कार्येहि नष्टे चैकं परित्यजेत् ॥ (24)
- उद्दिष्टेचैकमादाय शेषकार्यतु पूर्ववत् ।
द्रुतादिकान्तप्रस्तारं हारखण्डचतुष्टये ॥ (25)
- तत्प्रधानकं रूपं कृत्वा तु प्राक् निरर्थवत् ।
तत्तत्संख्यान्ततः प्रश्नो नष्टोद्दिष्टे तु पूर्ववत् ॥ (26)
- नष्टोद्दिष्टं कथं चात्र मध्यरूपोपरिस्थिते ।
निश्चित्य मध्यरूपाङ्कं तत्रैकाङ्कं परित्यजेत् ॥ (27)
- शेषप्रश्नाङ्कमादायोपरिनिष्ठन्तु पूर्ववत् ।
उद्दिष्टे लब्धकाङ्केषु मध्याङ्कं तत्र पातयेत् ॥ (28)
- शेषमेकं समादाय शेष कार्यतु पूर्ववत् ।
नष्टोद्दिष्टप्रकारं हि मध्यरूपादधः कथम् ॥ (29)
- लुप्तमध्याङ्के चैकं युक्तान्यत् पूर्ववत्स्मृतम् ।
उद्दिष्टे मध्यमाङ्केषु लब्धाङ्कान् सुपरित्यजेत् ॥ (30)

शिष्टमध्याडकतश्चैकमादायोद्दिष्टमीरितम् ।
संख्याडकसन्ततेश्चाथ आदावेकाडकं न्यसेत् ॥ (31)

अन्त्योपरिस्थ संख्याङ्कान्त्यादींश्चरस्तथ ।
स्वपडिक्तस्थां लिखेदग्रे संयोज्येष्टद्रुतं क्रमात् ॥ (32)

मीयन्ते सर्वभेदस्थाः पातालस्सोऽभिधीयते ।
अन्त्योपान्त्य तुर्य षष्ठमन्त्यादूर्ध्वस्थितं तथा ॥ (33)

पञ्चाङ्कयोगादःत्याङ्को भवेत् पाताल संज्ञकः ।
संख्योपान्त्यं पातयित्वा पातालान्याङ्कतः क्रमात् ॥(34)

तच्छिष्टाङ्कश्च पातालोपान्त्याधः क्रमेशो लिखेत् ।
तदङ्कात् सर्वपातालमादिरोद्धितलोदितम् ॥ (35)

द्रुतलघुगुरु त्रिमात्रामेरुसंयोग मेरवो व्यर्थाः ।
इति मत्याऽत्र न लिखिताः पर्वतखाननाच्च मूषकप्राप्तिः ॥(36)

5.2.1. FREE ENGLISH TRANSLATION

1-2B : These are the four Upāyas to know precisely the varieties of Dēśya Tālas : Prastāra, Saṅkhya, Naṣṭa and Uddiṣṭa.

PRASTĀRA

2C-7 : Write the desired Tāla to be permuted in its original form and (among its Aṅgas) under the first Mahat (higher Aṅga) Alpa (lower Aṅga) is established, writing the remaining as in the above line. If there is a lesser Aṅga behind this, then the one on the left should be regarded as Mahat and should be written (again) for completing the Tāla. If it is not available Alpa itself should be written. This procedure should be incessantly continued till only Drutas remain. In Laghu, in Guru and in Pluta, permutation should be carried out individually and in combination. But there is no permutation in a single individual Druta. 'You have described permutation only in DLGP but not for Virāma etc., why?' (if so objected) I shall explain. If prastāra etc., of Virāma, which is of the nature of pause are executed, then it contradicts the prastāra of DL. Also it creates a logical fallacy of over-extension (Ativyāpti) leading to confusion in the Śāstra. Therefore the description of prastāra of Virāma of LGP is futile.

SAṅKHYA

8-13B : Write figures '1 & 2', then combine the ultimate with the precedent second (penultimate), 4th and 6th figures. If the 4th and 6th are absent, it (i.e., the last figure) should be added instead to the 3rd and 5th respectively. Thus, a series of figures should be written to the right further and further. It (i.e., the series of figures) should be ended with the number of Drutas equal to the size of the permuted Tāla. Druta, Laghu, 1½ Mātra, Guru, 2½ Mātras, Pluta, 3½ Mātras - in this way the number of Tāla varieties having Drutas, regularly increased by one, can be known from the figures written here. By adding whatever figures the final figure is obtained, from these figures, the number of Tāla varieties ending in Druta, ending in Laghu, ending in Guru and ending in Pluta can be obtained as stated by Śārṅgadēva.

NAṢṬA

13C - 19 : Wherein it is asked here (i.e., in the Saṅkhya series) 'what is the form of such and such numbered Tāla variety?' it is named Naṣṭa. Its answer is now given. Whatever the varieties among which the Naṣṭa question is raised, the Saṅkhya series should be written till that figure. Then from the remainder the further and further precedent figures should be subtracted. While doing so that which cannot be subtracted indicates Druta. If its previous figure remains un-subtracted, the subtracted figure adds to the next of the 'Akṛtārtha', and if that is not available it adds to the figure previous to the 'Akṛtārtha'. If there are figures

which can be subtracted discontinuously (i.e., at intervals), the Laghu is to be reckoned as separate. But if they can be subtracted consecutively or successively such a Laghu becomes Guru. If the third figure from that figure which yields Guru, can be subtracted, the Guru becomes the Pluta. If there are no figures left for subtraction, Drutas should be added till the Tāḷa is completed. The answer to determine the form of the desired Tāḷa variety should be thus known from Naṣṭa.

UDDIṢṬA

20-22B : Wherein it is asked ' how manieth is the Tāḷa variety as derived here in Naṣṭa ?' it is Uddiṣṭa. Herein the Saṅkhyā series of figures should be written as in Naṣṭa. Whatever the figures, which, on subtraction give whatever Pluta etc., in Naṣṭa, the same figures should be added and subtracted from the final figure (indicating Naṣṭa). Uddiṣṭa results from the same figures which are the remainders.

VIPARĪTA - PRASTĀRA

22C - 23 : In the reversed Tāḷa - prastāra, DLGP should be written in reverse order respectively, one below the other. The Aṅga higher to it should be written to the left. Drutas should be added to the right till the Tāḷa is completed. But, prastāra should be executed by dropping respectively the one's line to the left.

VIPARĪTA - NAṢṬĪDDIṢṬA

24 - 25B : 'How to understand Naṣṭīddiṣṭa in this Viparīta - prastāra?' (both) should be done from the question numbers themselves. But, in Naṣṭa '1' should be subtracted, in Uddiṣṭa '1' should be added. The remaining procedures are as before.

DRUTAĪHĀRA - NAṢṬĪDDIṢṬA

25C - 26 : In the prastāra of four garland segments ending in Druta etc., the respective (form) should be made predominant and the precedent is to be ignored. The respective question number should then be subtracted from Saṅkhyā. Naṣṭīddiṣṭa are as before.

MADHYARŪPA - UPARISTHITA - NAṢṬĪDDIṢṬA

27-29B : Here, how are Naṣṭīddiṣṭa executed? Determine the figure of the medial form (Madhyarūpa). Subtract '1' from it. Add to the remainder the question number which is above. In Uddiṣṭa subtract the figure of the medial from the 'Labdha' figure. Add '1' to the remainder. The remaining procedure is as above.

MADHYARŪPA - ADHASTHITA - NAṢṬĪDDIṢṬA

29C-31B : 'How are Naṣṭa and Uddiṣṭa to be executed below medial form?' Add '1' to the subtracted figure of the medial form?' The rest is as before. In Uddiṣṭa the 'Labdha' figure is subtracted from the medial number. By adding '1' to the remaining figure of the medial form, Uddiṣṭa is described.

PĀTĀLA

31C-34B : The digit '1' should be written at the bottom (i.e., at the extreme left) of the Saṅkhyā series. The Saṅkhyā number above the last (number in the Pātāḷa row) as well as the four numbers beginning with the last (viz., last, second, fourth and sixth) its own row, should be written.

When added together, regularly, they enumerate exactly all the Drutas in all the permutations of a prastāra. This is called Pātāḷa. The final number obtained by adding together these five numbers viz., the ultimate, penultimate, fourth and sixth as well as the number (of Saṅkhya) lying above the ultimate is called Pātāḷa.

SARVAPĀTĀḷA

34C-35 : By subtracting the penultimate (Upāntya) Saṅkhya figure from the ultimate (Antya) Pātāḷa figure, further and further, the remaining figure should be written below the penultimate of the Pātāḷa regularly. By such figure Sarvapātāḷa (Mahāpātāḷa) is taught as described by Viṭṭhala.

MĒRUS OF AṄGAS

36 : Thinking that the mērus of Druta, Laghu, Guru and Pluta and the Saṅyōga - mērus are useless, they are not written here, because it would be like getting a mouse by digging a mountain.



Chapter - 6
TĀḶAPRASTĀRA - A CRITIQUE

6.1. DETAILS OF TREATISES

Though the TāḶa chapter of Indian music is furnished in many of our ancient and recent books, the intricacies of this element, Prastāra are dealt with only in the following books:

1. Saṅgītasamayāsāra: This is written in between 12th and 13th centuries by Pārśvadēva in Sanskrit. In the annals of our music literature this is the first book in which the serial numbers for the TāḶas are furnished. While 50 TāḶas having such serial numbers are furnished in this book 10 numbers of them are suitably modified by this author. The details of all these TāḶas are furnished elsewhere in this book.

2. Saṅgīta Ratnākara: This is written in the 13th century in Sanskrit by Niḥśanka Śārṅgadēva. Among the 400 Ślōkas of the 5th chapter TāḶādhyāya of this treatise 100 Ślōkas are devoted for TāḶaprastāra itself which obviously reveals the great importance given to this topic even in those olden days (all these Ślōkas are furnished elsewhere in this book along with free translation). In no other treatise this much of material pertaining to this topic has ever been furnished. In this book the Caturaṅga-prastāra by which the four Aṅgas, Druta, Laghu, Guru and Pluta pertaining to Caturaśra-jāti only are permuted is defined. In the TāḶādhyāya of this book in respect of this prastāra 19 easy methods are furnished at the first instance. They are suitably modified by this author. Some easy methods to obtain the required prastāra even without making the process of permutation at all are furnished in this book. But as ambiguity and contradiction reigns this topic this is not within the easy reach of the aspirant.

3. Saṅgītōpaniṣatsārōddhāra: This is the compendium of the great Saṅgītōpaniṣat written in the 14th century by the author Sudhākalaśa himself in Sanskrit. Unfortunately in the absence of the original treatise this abridged edition has become the only source to get the gist of it. This is unique in furnishing an easy method 'Kalita' which was not furnished by any other author and which helps to obtain the full details of all the Aṅgas occurred until a required permutation. No details of any tables or their Naṣṭa or Uddiṣṭa are furnished in it.

4. TāḶakalābdhi : As per the details furnished by M.Rāmakṛṣṇakavi in his Bharatakōśa this is written by Acyutarāya in the 16th century in Sanskrit. As per the brief details available the Anudruta-prastāra, Virāma-prastāra, Krama-prastāra, Viparita-krama-prastāra, Saṅkhyā, Naṣṭōddiṣṭa, PātāḶa and some tables are said to have been furnished in it.

5. Saṅgītasūryōdaya: This is written in the 16th century by Bhandāru Lakṣmīnārāyaṇa in Sanskrit against which the author claimed that he was honoured with Gajārōḥaṇam and Kanakābhīṣēkam by the then King Srīkṛṣṇadēvarāya. Among the five chapters of this treatise the first one is the TāḶādhyāya and among the 575 Ślōkas of it 270 are devoted for TāḶaprastāra itself. Pañcāṅga-prastāra containing Anudruta and relevant Saṅkhyā, Naṣṭōddiṣṭa and PātāḶa along with the tables, Virāma-prastāra and relevant Saṅkhyā, Naṣṭōddiṣṭa and PātāḶa along with the tables are furnished in this treatise. Khaṇḍa-naṣṭōddiṣṭa has not been furnished at all. But, like in Saṅgīta Ratnākara, as ambiguity and contradiction reigns the topic this is also not within the reach of the aspirant.

6. Nartananirṇaya : This is written in the 16th century by Paṇḍarīka Viṭṭhala in Sanskrit. Saṅkhyā, Naṣṭōddiṣṭa, PātāḶa and SarvapātāḶa of the old Caturaṅga-prastāra are furnished in this book. This book is unique in furnishing the SarvapātāḶa, Viparita-prastāra, Naṣṭōddiṣṭa, Madhyarūpa-uparisthita-naṣṭōddiṣṭa and adhaḥ sthita-naṣṭōddiṣṭa with some details for the first time.

7. Saṅgīadarpaṇa : This is written in between the 16th & 17th centuries by Catura Dāmōdara Paṇḍita in Sanskrit taking the Ślōkas mostly from Saṅgīta Ratnākara. Saṅkhyā, Naṣṭa, Uddiṣṭa, Pātāḷa of Caturaṅga-prastāra, the relevant tables of their Naṣṭa and Uddiṣṭa, Virāma-prastāra, Naṣṭa and Virāma-mēru are defined in this book. Even in this book the ambiguity and contradiction reigns the topic.

8. Tāḷadaśapraṇapradīpika : This is written in the form of Telugu poems in the 17th century by Pōlūri Gōvindakavi. Caturaṅga-prastāra, Pañcāṅga-prastāra with Anudruta, Saṅkhyā, Pātāḷa, Sarvapātāḷa, Naṣṭōddiṣṭa of the five Jātis and different tables are defined only in poems but not even a single table is furnished. Saṁyōga-mēru has not been furnished at all. The important points of this topic are not easily understandable at all.

9. Rāgatālacintāmaṇi : This book is also written in the form of Telugu poems in the 17th century by Pōlūri Gōvindakavi himself. Caturaṅga-prastāra, Pañcāṅga-prastāra with Anudruta, Saṅkhyā, Pātāḷa and Naṣṭōddiṣṭa of the five Jātis are defined in the form of poems but not even a single table is furnished or defined.

10. Tāḷasamudram : This is written in the 17th century by Vanapāda Cūḍāmaṇi in Tamil following Saṅgīadarpaṇa.

11. Tāḷalakṣaṇam : The author of this work has yet to be found. If the contents of Prastāra of this work is taken into consideration there is scope to decide that this treatise is written around 17th century. Though all the 10 elements of the Tāḷa are defined in it little more importance is given to the 10th element, Prastāra. In Prastāra the Caturaśra-jāti Pañcāṅga-prastāra along with its Saṅkhyā, Pātāḷa, Naṣṭa, Uddiṣṭa and five mērus (tables), Virāma-prastāra along with its Saṅkhyā, Pātāḷa, Naṣṭa, Uddiṣṭa and four mērus (tables) and Caturaṅga-prastāra along with its Saṅkhyā, Pātāḷa, Sarvapātāḷa and four mērus (tables) are furnished. Saṁyōga-mēru has not been furnished at all. 'Pratinidhi' system, Naṣṭa and Uddiṣṭa are defined as in Saṅgīta Ratnākara.

12. Tāḷārṇavam : The author of this work has yet to be found. If the contents of Prastāra of this work is taken into consideration there is scope to decide that this treatise is written around 17th century. Though all the ten elements of the Tāḷa are defined in it much importance is given to the tenth element, Prastāra only. In Prastāra the Caturaṅga-prastāra along with its Saṅkhyā, Pātāḷa, Adhō-pātāḷa, Naṣṭa, Uddiṣṭa and four mērus (tables) and the Tisra, Miśra and Khaṇḍa-jātis of Pañcāṅga-prastāra along with their respective Saṅkhyā, Pātāḷa, Naṣṭa, Uddiṣṭa and five mērus (tables) are furnished. Neither the details of Saṅkīrṇa-jāti nor any of the Saṁyōga-mērus nor even the Naṣṭa or Uddiṣṭa of Khaṇḍa-prastāra are furnished. While almost all the authors of the post Ratnākara period have truly followed Ratnākara in many ways the author of this work prescribed some modern easy methods of this element. That is the importance of this treatise. In regard to Tāḷas there are some more new points of interest in this work.

13. Vaiṣṇava Saṅgīta Śāstra : This is written in the 18th century by Narahari Cakravarti in Sanskrit. Saṅkhyā, Uddiṣṭa and Naṣṭa pertaining to Caturaṅga-prastāra are furnished very briefly in this book.

14. Gāyakaḷocanam : This is written and published in 1902 by Taccūr Siṅgarācārya Bros., in Telugu. The modes of permutation of Caturaṅga-prastāra and Pañcāṅga-prastāra with Anudruta along with the relevant tables are furnished but nothing has been defined at all in this book. In the

annals of our music literature there are only two books in which the serial numbers for the Tāḷas are furnished and while the Saṅgīta Samayasāra is the first one this Gāyakalōcanam occupies the second place. In this book around 160 Tāḷas are furnished along with new names, Aṅgas and serial numbers among which 50 of them are suitably modified by this author.

15. Mathematical basis of the Tāḷā-system : This is written and published in 1962 by K.Rāmacandran. In this book the Saṁyuktāṅga-prastāra in which Aṅgas of all the denominations are used in the process of permutation is elaborated in terms of figures and the Akhaṇḍa-saṅkhyā, Naṣṭa and Uddiṣṭa are explained in a circuitous manner with an arithmetical approach.

Among the above, Saṅgīta Ratnākara, along with two commentaries, had furnished more detailed information with tables of figures and definitions about this element than any other book. The Tāḷādhyaḃya of this in total, consists of 408 Ślōkas, in which the five Mārga Tāḷas are elaborated in the first 235 Ślōkas, the 120 Deśī Tāḷas are listed out in the next 76 Ślōkas and the element, Prastāra itself is elaborated in the remaining 97 Ślōkas. The greater importance of this element has very well been noticed, even in those olden days by Śārṅgadēva who had obviously devoted nearly one-fourth of his Tāḷa-chapter for its elaboration only. But, unfortunately, not only in the commentaries of Kallinathā and Siṁhabhūpāla but also even in the text some confusive versions are furnished. Later, some interesting new methods of this element are furnished by Sudhākalaśa, Acyutyarāya and Paṇḍarīka Viṭṭhala in their works.

In addition to the Caturaṅga-prastāra (Caturaśra-jāti), which has been elaborated with the help of tables of figures and definitions in Saṅgīta Ratnakara & Saṅgīta Darpaṇa, Virāma-prastāra is also defined briefly in Saṅgīta Darpaṇa. While both Pañcāṅga-prastāra (Caturaśra-jāti) and Virāma-prastāra are elaborated in Saṅgītasūryōdaya with the help of tables of figures and definitions, both Caturaṅga (Caturaśra-jāti) and Pañcāṅga (Trisra, Khaṇḍa, Miśra & Saṅkīrṇa-jātis) - prastāras have been elaborated in Rāgatāḷacintāmaṇi and Tāḷadaśaprārapradīpika with the help of only poems but without any tables of figures. And in Gāyakalōcanam a number of tables of figures pertaining to both Caturaṅga (Caturaśra-jāti) and Pañcāṅga (Trisra, Khaṇḍa, Miśra & Saṅkīrṇa-jātis) - prastāras are furnished but without any definitions.

So, to bring out all the latent secrets of this element within the easy reach of the aspirant these following modifications are made by the author to help clear understanding of the various techniques and also to remove the textual inconsistencies in the different early texts dealing in these matters.

6.2. MODES OF PERMUTATION

In the ancient days only Caturaṅga-prastāra, in which the four Aṅgas, Druta, Laghu, Guru and Pluta are used in the process of permutation of the Aṅgas pertaining to Caturaśra-jāti only, is used. In those days, while Virāma is prohibited to be used only in the process of permutation (but not from usage) having a fluctuative value of half-duration of another Aṅga to which it is appended, Kākapāda is prohibited not only in the process of permutation but also even from using it in any Tāḷa, which is not justifiable as it is prescribed in some of the Tāḷas like Siṁhanandana.

Later, along with this Caturaṅga-prastāra, the Pañcāṅga-prasatra in which the five Aṅgas, Anudruta, Druta, Laghu, Guru and Pluta are used in the process of permutation of Aṅgas pertaining to all Jātis other than Caturaśra-jāti, is also used. Around this time, Virāma-prastāra, which is even basically incorrect wherein the process of permutation is concluded with either Druta or Druta-virāma or both, violating the general norm of concluding with either Virāma or Druta, is also furnished in some books.

Some time later, another Śōḍaśāṅga-prastāra, in which all the six Aṅgas, Anudruta (Anudruta is called as Virāma having a fixed duration of one-unit at this time), Druta, Laghu, Guru, Pluta and Kākapāda, along with interlaced combinations of these above Aṅgas, are used in the process of permutation of Aṅgas pertaining to Caturaśra-jāti only, in which Śarabhanandana Tāḷa is one of these varieties.

Now, in this book (a) Pañcāṅga-prastāra, where in the five Aṅgas, Druta, Laghu, Guru, Pluta and Kākapāda are used in the process of permutation of Aṅgas pertaining to only Caturaśra-jāti, (b) Ṣaḍaṅga-prastāra, wherein all the six Aṅgas, Anudruta, Druta, Laghu, Guru, Pluta and Kākapāda are used in the process of permutation of Aṅgas of all Jātis and (c) Saṁyuktāṅga-prastāra (correct name of Śōḍaśāṅga-prastāra), wherein all the six Aṅgas, Anudruta (called as Virāma having a fixed duration of one-unit), Druta, Laghu, Guru, Pluta and Kākapāda, along with other interlaced combinations of all these above Aṅgas, are used in the process of permutation of Aṅgas pertaining to all Jātis (prescribed in figures but could be transliterated into Aṅgas) are furnished with tables of figures, definitions and suitable rules framed by the author.

6.3. ALLOCATION OF DIVISIONS OF PRASTĀRA

In his Saṅgīta Ratnākara Śārṅgadēva had furnished 19 easy methods to know the details of the rhythmical forms and they are: 1. Prastāra 2. Saṅkhyā 3. Naṣṭa 4. Uddiṣṭa 5. Pātāḷa 6. Druta-mēru 7. Druta-mēru-naṣṭa 8. Druta-mēru-uddiṣṭa 9. Laghu-mēru 10. Laghu-mēru-naṣṭa 11. Laghu-mēru-uddiṣṭa 12. Guru-mēru 13. Guru-mēru-naṣṭa 14. Guru-mēru-uddiṣṭa 15. Pluta-mēru 16. Pluta-mēru-naṣṭa 17. Pluta-mēru-uddiṣṭa 18. Saṁyōga-mēru and 19. Khaṇḍa-prastāra. As all these are only easy methods and also as this total number varies with the other modes of permutation like Pañcāṅga-prastāra and Ṣaḍaṅga-prastāra which are named basing upon the number of Aṅgas used in the process of permutation, they cannot be treated as divisions at all. So, to make it applicable to all the different modes of permutation suitable system of divisions which has been formulated by this author is furnished hereunder.

In each mode of permutation there are two main divisions namely 1. Akhaṇḍa-prastāra and 2. Khaṇḍa-prastāra among which the Khaṇḍa-prastāra has to sub-divisions namely 1. Hīna-prastāra and 2. Yukta-prastāra. All these divisions consist of two different processes of permutation namely 1. Anulōma-prastāra and 2. Vilōma-prastāra and two key-figures namely 1. Saṅkhyā and 2. Mahāpātāḷa which are the total number of prastāras and the total number of Tāḷāṅgas used in the process of permutation respectively. Even without adopting the laborious process of permutation there are very interesting easy methods to obtain the above two key-figures of Saṅkhyā and Mahāpātāḷa and also to obtain the ‘series of Tāḷāṅgas of a particular serial number of a prastāra in question’, the ‘serial number of a prastāra in question consisting of a particular series of Tāḷāṅgas’ and the ‘total number of all the different Tāḷāṅgas used upto a particular serial number of prastāra in question’ which are named as ‘Naṣṭa, Uddiṣṭa and Kalita’ respectively. Among them to resemble the name of Khaṇḍa-prastāra the Nija-prastāra is named after Akhaṇḍa-prastāra by the author. In the same manner to maintain similarity in names the Viparīta-prastāra of Paṇḍarīka Viṭṭhala is named after Vilōma-prastāra and the usual Krama-prastāra is named after Anulōma-prastāra by the author. Among them the ‘Kalita’ is prescribed by Sudhākalaśa.

6.4. RULES FOR THE PROCESS OF PRASTĀRA

The mode of permutation was not defined clearly in any book, as such, suitable rules for all kinds of permutations are formulated and furnished in the II chapter of this book with examples.

6.5. THE PROCESS OF ARRIVING AT THE FIGURES OF TABLES

In respect of writing the figures of the different tables Śārṅgadēva contradictively prescribed to write figures both '1 & 2' for Saṅkhyā of Akhaṇḍa-prastāra and '1' or both '1 & 2' for different lines of different tables in different ways. But, he did not give any explanation for this disparity. He also prescribed to take the 3rd and 5th figures, which were called 'Pratinidhis' (proxies) by him, into account in the absence of the 4th and 6th preceding figures respectively but its application differs with each table and its lower and upper horizontal lines. More-over, in support of the application of these 'Pratinidhis' to all the other tables he had gone to the extent of even deliberately altering the correct version of Druta-mēru. In Tāḷadaśapraṇapradīpika, Rāgatālacintāmaṇi and Tālārṇavam it is prescribed to write figure '1' (Āśa) even before the very 1st house of Saṅkhyā and in Gāyakaḷocanam, correctly, the figure '1' is written, even before the very first house of Saṅkhyā of all the tables thus eliminating this 'Pratinidhi'.

So, figure '1' is hereby prescribed to be written in the left extreme, even before the very first house, of all Saṅkhyā lines and the lowest-lines of all the tables of all the Aṅgas (except for Saṃyōga-mēru) pertaining to all modes of permutation as prescribed in Gāyakaḷocanam. Thus, the cumbersome 'Pratinidhi' has entirely been eliminated, but, the word 'Pratinidhi (proxy)' has been prescribed in this book to be used in a different way representing the numbers of the preceding houses, which are basically most important of this element, along with the relevant rules to arrive at the figures of all the tables.

6.6. PĀTĀḷA AND MAHĀPĀTĀḷA

The 'Pātāḷa' furnished by Śārṅgadēva, in his Saṅgīta Ratnākara denotes the total number of the inferior Aṅgas used in the process of Akhaṇḍa-prastāra and its figures could be obtained by writing the total of the figures of the upper Saṅkhyā-house of the preceding 1st and preceding 1st, 2nd, 4th and 6th houses of the same Pātāḷa-line.

Along with the above Pātāḷa, another 'Mahāpātāḷa' which denotes the total number of all the different Aṅgas used in the process of permutation, has also been furnished by Paṇḍarīka Viṭṭhala in his Nartananirṇaya but he prescribed to obtain it by subtracting the penultimate (Upāntya) Saṅkhyā from the ultimate (Antya) Pātāḷa figure and write the remainder below the penultimate of Pātāḷa. This rule does not facilitate to write the Mahāpātāḷa figures from the very first house. But, as per the version prescribed in Tāḷadaśapraṇapradīpika they could be obtained by writing the total of the preceding 1st, 2nd, 4th and 6th figures of Pātāḷa treating the respective upper Pātāḷa-figure as the preceding 1st.

14. MODIFIED VERSION OF CATURĀṄGA -AKHAṄḌA -PRASTĀRA

(a) Version furnished in Sangīta Ratnākara :

O	I	OI	S	OS	Ś	OŚ	IŚ	OIŚ
1	2	3	6	10	19	33	60	106
1	2	5	10	22	44	91	180	358

(b) Version furnished in Gāyakaḷōcanam :

	O	I	OI	S	OS	Ś	OŚ	IŚ	OIŚ
1	1	2	3	6	10	19	33	60	106
	1	2	5	10	22	44	91	180	358
	1	3	7	16	34	72	147	298	592

(c) Modified Version :

	1	2	3	4	5	6	7	8	9
1	1	2	3	6	10	19	33	60	106
	1	3	7	16	34	72	147	298	592

In fact, the Pātāḷa figures are also included in Mahāpātāḷa and Mahāpātāḷa is far more useful than Pātāḷa facilitating very easy application of 'Kalita' which furnishes the full details of all the Aṅgas until the required prastāra in question. Keeping the multipotency of Mahāpātāḷa in view, the Pātāḷa has entirely been eliminated in this book and Mahāpātāḷa, with a direct link with Saṅkhyā, which has been discovered by the author of this book, has been furnished and the same could be obtained by arriving at the total of all the respective preceding proxies of both Saṅkhyā and Mahāpātāḷa together. Moreover, unlike in any other book this Mahāpātāḷa has also been extended to almost all the tables of Khaṇḍa-prastāra and furnished with tables of figures and suitable key-rules in the III chapter of this book.

6.7. AKHAṆḌA NAṢṬA AND UDDIṢṬA

Naṣṭa and Uddiṣṭa, which could be answered with the help of Saṅkhyā are the most important and vital aspects of this element and they are elaborated from the Ślōkas 13th to 23rd of Saṅgīta Ratnākara. This is the only book in the annals of our music literature in which Naṣṭa and Uddiṣṭa are furnished with definitions and examples by the commentators than any other book. But, unfortunately, the modus operandi of Naṣṭa and Uddiṣṭa furnished in it is not at all clear to follow and it looks either the author himself or the commentators or even the editors have furnished their respective versions keeping the answers only first in view.

In his Nartananirṇaya, along with the general Naṣṭōddiṣṭa, Paṇḍarīka Viṭṭhala prescribed entirely different varieties and they are : 1. Sarvapātāḷa 2. Viparīta-naṣṭōddiṣṭa 3. Drutahāra-naṣṭōddiṣṭa 4. Madhyarūpa-uparisthita-naṣṭōddiṣṭa and 5. Madhyarūpa-adhasthita – naṣṭōddiṣṭa. Among them Viparīta (reverse) – naṣṭōddiṣṭa is re-named as 'Vilōma-naṣṭōddiṣṭa' to be identical with the name of 'Anulōma-naṣṭōddiṣṭa' which is the general obverse-naṣṭōddiṣṭa and they both are included in the divisions of Naṣṭa and Uddiṣṭa. The prastāras, basing upon the Aṅgas occur in the right extreme, are called as Drutānya-prastāras, Laghvanta-prastāras, Gurvanta-prastāras etc. But, Paṇḍarīka Viṭṭhala named them as Drutahāra-prastāras etc., treating the Drutas etc., which occur in the right extreme as pendants and accordingly he had also prescribed Drutahāra-naṣṭōddiṣṭa with a brief definition following the general Naṣṭa. As the application of the process of this Drutahāra-naṣṭōddiṣṭa is one and the same as in general Naṣṭōddiṣṭa this had been dropped.

Paṇḍarīka Viṭṭhala had also briefly prescribed Madhyarūpa-uparisthita – naṣṭōddiṣṭa and Madhyarūpa-adhasthita-naṣṭōddiṣṭa which facilitate to obtain the Naṣṭōddiṣṭa for the upper and lower prastāras of a midmost-prastāra. As their respective rules for the mode of application are inadequate relevant rules are framed by the author and prescribed in this book. Though the rules prescribed by him for Uparisthita-naṣṭōddiṣṭa are not incorrect, another set of rules are framed by the author and prescribed in this book bringing out the very important link between the Vilōma-Saṅkhyā and the respective prastāra discovered by the Great Paṇḍarīka Viṭṭhala.

All these rules, including the modified rules of Saṅgīta Ratnākara, are furnished in this book with a number of examples.

6.8. AKHAṆḌA KALITA

While finding a new method for writing the figures of Mahāpātāḷa linking them with Saṅkhyā directly and entirely eliminating the less important Pātāḷa, a very interesting link between these two lines of Saṅkhyā and Mahāpātāḷa has, accidentally, been discovered by the author which facilitates to know the full details of all the Aṅgas upto a required permutation in question and this has been named by the author as 'Naṣṭaṅga' and prescribed with examples in the first Telugu addition of

Tālaprastārasāgara, along with relevant key-rules. But, a similar method which has long ago been named as ‘Kalita’ by Sudhākalaśa has later been found in his Saṅgītōpaniṣatsārōddhāra. So, the ‘Naṣṭāṅga’ has been re-named as Kalita and mentioned in this book but linking it with Saṅkhyā and Mahāpātāḷa and extending it to both Akhaṇḍa and Khaṇḍa-prastāras alike.

6.9. TABLE OF DRUTA (DRUTA-MĒRU)

The Druta-mēru furnished by Śārṅgadēva in his Saṅgīta Ratnākara is not in accordance with the other tables given by himself. In Gāyakaḷōcanam at the top of each vertical line of Druta-mēru while furnishing the value of prastāra the Aṅgas of the first-prastāra are furnished. As, writing thus the Aṅgas of the first-prastāra at the top sometimes becomes contrary in respect of the Devoid-permutation or containing-permutation of a specific nature, the value of the prastāra is furnished in figures at the top in this book. The Druta-mēru is properly modified and furnished with relevant key-rules in this book.

6.10. TABLE OF COMBINATIVE AṅGAS (SAMŪYŌGA-MĒRU)

As in the case of the Druta-mēru Śārṅgadēva had also furnished an altered version of Saṅyōga-mēru in his Saṅgīta Ratnākara. In it, in total, while there are 13 horizontal lines basing upon the unit-value of permutations in increasing order i.e. 1-Druta, 2-Drutas, 3-Drutas and so on upto 13-Drutas there are 15 vertical lines pertaining to IAEPs (Identical-aṅga-ending-permutations) of 1. Druta 2. Laghu 3. Guru 4. Pluta, duplets of 5. DL 6. DG 7. DP 8. LG 9. LP 10. GP, triplets of 11. DLG 12. DLP 13. DGP 14. LGP and a quadruplet of 15. DLGP. Unfortunately, he had so altered the order of these vertical lines that he had to add 1, 3, 5, 1, 1 & 3 numbers of zeros extra in the beginning of each of the vertical lines of L, G, P, DP, LP and GP respectively. Had he made the correct division basing upon their unit-value in serial order i.e., 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, & 26 units of D, L, DL, G, DG, LG, P, DLG, DP, LP, DLP, GP, DGP, LGP and DLGP respectively, it would have been more aesthetic and also helpful to the reader by avoiding the extra zeros. As this method prescribed in Saṅgīta Ratnākara went wrong while writing such figures pertaining to other Jātis of other modes of permutation, another specific method which could be applicable to Saṅyōga-mērus of all the Jātis of all modes of permutation is discovered by the author and furnished with suitable key-rules in this book.

In the end of the commentary of 369th (58th) Ślōka, Kallinātha had incorrectly prescribed to write figure ‘4’ instead of figure ‘3’ in the 8th house of the GP line.

In Gāyakaḷōcanam, probably being unaware of the correct version of Saṅyōga-mēru, an entirely different version with different name ‘Samudāyāṅgamēru’, which is of a mere duplication of figures of all the tables of Aṅgas together, is furnished by the authors.

So, keeping all the above in view, the modified version of Saṅyōga-mēru, including Mahāpātāḷa also in it, which is applicable to all the Jātis and modes of permutation, is furnished with suitable key-rules in this book.

6.11. KHAṆḌA NAṢṬA, UDDIṢṬA & KALITA

Not only for all the tables of Akhaṇḍa-prastāra but also for all the tables of Khaṇḍa-prastāra (except for Saṅyōga-mēru) the rules for the proper application of Naṣṭa, Uddiṣṭa and Kalita are formulated by the author and furnished elsewhere in this book along with selected examples.

15. MODIFIED VERSION OF CATURĀṄGA DRUTA-MĒRU

(a) Version furnished in Sangīta Ratnākara :

						1	1		
					1	1	7	8	
			1	1	5	6	20	27	
	1	1	3	4	9	14	25	44	
1	1	2	2	5	4	12	7	26	
1	2	3	4	5	6	7	8	9	

(b) Version furnished in Gāyakaḷōcanam :

										OIS									
										IS	1	9D							
										OS	1	0	8D						
										Ṣ	1	0	8	7D					
										OS	1	0	7	0	6D				
										S	1	0	6	0	27	5D			
										01	1	0	5	0	20	0	4D		
										I	1	0	4	0	14	0	44	3D	
										0	1	0	3	0	9	0	25	0	2D
										1	0	2	0	5	0	12	0	26	1D
1	0	1	0	2	0	4	0	7	0	7	0	0	0	0	0	0	0	0	OD

(c) Modified Version :

																					1	9								
																					1	0	8							
																					1	0	8	7						
																					1	0	7	0	6					
																					1	0	6	0	27	5				
																					1	0	5	0	20	0	4			
																					1	0	4	0	14	0	44	3		
																					1	0	3	0	9	0	25	0	2	
																					1	0	2	0	5	0	12	0	26	1
1	0	1	0	2	0	4	0	7	0	7	0	0	0	0	0	0	0	0	0	1	0	1	0	2	0	4	0	7	0	0

16. LIST OF COMBINATIVE ĀNGAS

(Pañcāṅga, Ṣaḍaṅga & Saṁyuktāṅga)

Sl. No.	2	3	4	5	7	9	3	4	5	7	9	Sl. No.							
1	0	1	U	1	1	1	1	1	1	1	1	OI+	17	22	27	37	47	33	
2	I	2	0	2	2	2	2	2	2	2	2	UOŚ	18	23	28	38	48	34	
3	OI	3	UO	3	3	3	3	3	3	3	3	UOI+	”	”	”	”	”	35	
4	S	4	I	”	4	5	7	9	”	”	”	ISS	”	↕	24	30	42	54	36
5	OS	5	UI	4	5	6	8	10	”	”	”	S+	”	”	”	”	”	37	
6	IS	6	OI	5	6	7	9	11	”	”	”	UIS	19	25	31	43	55	38	
7	Ś	”	UOI	6	7	8	10	12	”	”	”	US+	”	”	”	”	”	39	
8	OIS	7	S	”	8	10	14	18	”	”	”	OIS	20	26	32	44	56	40	
9	OŚ	”	US	7	9	11	15	19	”	”	”	OS+	”	”	”	”	”	41	
10	IŚ	8	OS	8	10	12	16	20	”	”	”	UOISS	21	27	33	45	57	42	
11	+	”	UOS	9	11	13	17	21	”	”	”	UOS+	”	”	”	”	”	43	
12	OIS	9	IS	”	12	15	21	27	”	”	”	IS+	”	28	35	49	63	44	
13	O+	”	Ś	”	”	”	”	”	”	”	”	Ś+	”	”	”	”	”	45	
14	SŚ	10	UIS	10	13	16	22	28	”	”	”	UIS+	22	29	36	50	64	46	
15	I+	”	UŚ	”	”	”	”	”	”	”	”	UŚ+	”	”	”	”	”	47	
16	OSS	11	OIS	11	14	17	23	29	”	”	”	OIS+	23	30	37	51	65	48	
17	OI+	”	OŚ	”	”	”	”	”	”	”	”	OŚ+	”	”	”	”	”	49	
18	ISS	12	UOIS	12	15	18	24	30	”	”	”	UOIS+	24	31	38	52	66	50	
19	S+	”	UOŚ	”	”	”	”	”	”	”	”	UOŚ+	”	”	”	”	”	51	
20	OISS	13	IŚ	”	16	20	28	36	”	”	”	IŚ+	”	32	40	56	72	52	
21	OS+	”	O+	”	”	”	”	”	”	”	”	UIŚ+	25	33	41	57	73	53	
22	IS+	14	UIŚ	13	17	21	29	37	”	”	”	OIŚ+	26	34	42	58	74	54	
23	S+	”	U+	”	”	”	”	”	”	”	”	UOIŚ+	27	35	43	59	75	55	
24	OIS+	15	OIŚ	14	18	22	30	38	”	”	”	SŚ+	”	36	45	63	81	56	
25	OS+	”	O+	”	”	”	”	”	”	”	”	USŚ+	28	37	46	64	82	57	
26	IŚ+	16	UOIŚ	15	19	23	31	39	”	”	”	OSS+	29	38	47	65	83	58	
27	OIŚ+	17	UO+	”	”	”	”	”	”	”	”	UOSS+	30	38	48	66	84	59	
28	SŚ+	18	SŚ	”	↕	20	25	35	45	”	”	ISS+	”	40	50	70	90	60	
29	OSS+	19	I+	”	”	”	”	”	”	”	”	UIS+	31	41	51	71	91	61	
30	ISS+	20	US	16	21	26	36	46	”	”	”	OISS+	32	42	52	72	92	62	
31	OISS+	21	UI+	”	”	”	”	”	”	”	”	UOISS+	33	43	53	73	93	63	
32			OSS	17	22	27	37	47										Contd.....	

1

1	1	24	8	47	4 - 7
2	2	25	1 - 8	48	1 - 3 - 7
3	1 - 2	26	2 - 7	49	5 - 6
4	3	27	3 - 6	50	1 - 4 - 6
5	1 - 3	28	1 - 2 - 6	51	2 - 3 - 6
6	4	29	4 - 5	52	2 - 4 - 5
7	1 - 4	30	1 - 3 - 5	53	1 - 2 - 3 - 5
8	2 - 3	31	2 - 3 - 4	54	11
9	5	32	9	55	1 - 11
10	1 - 5	33	1 - 9	56	2 - 10
11	2 - 4	34	2 - 8	57	3 - 9
12	1 - 2 - 3	35	3 - 7	58	1 - 2 - 9
13	6	36	1 - 2 - 7	59	4 - 8
14	1 - 6	37	4 - 6	60	1 - 3 - 8
15	2 - 5	38	1 - 3 - 6	61	5 - 7
16	3 - 4	39	1 - 4 - 5	62	1 - 4 - 7
17	1 - 2 - 4	40	2 - 3 - 5	63	2 - 3 - 7
18	7	41	1 - 2 - 3 - 4	64	1 - 5 - 6
19	1 - 7	42	10	65	2 - 4 - 6
20	2 - 6	43	1 - 10	66	1 - 2 - 3 - 6
21	3 - 5	44	2 - 9	67	3 - 4 - 5
22	1 - 2 - 5	45	3 - 8	68	1 - 2 - 4 - 5
23	1 - 3 - 4	46	1 - 2 - 8	69	12

s - 6		0 S - 10				- 19		0 - 3 3					I - 60		
L	G	D	L	G	1	D	L	D	L	G	P	1	D	L	G
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	5	0	0	0	6	0	0	0	0	0	0
0	0	4	0	0	0	1	0	0	14	4	0	0	0	10	0
1	0	0	3	0	9	6	0	0	0	10	0	0	25	18	1
3	1	5	4	2	0	7	5	1	12	12	10	2	0	21	20
2	5	0	3	8	4	5	14	18	0	7	23	31	7	10	39

18. MODIFIED VERSION OF SAṂYŌGA-MĒRU

(a) Version furnished in Saṅgīta Ratnākara :

0	I	S	Ś																	
1	0	0	0																	
1	1	0	0	0I																
1	0	0	0	2																
1	1	1	0	3	OS															
1	0	0	0	7	2	OŚ	IS													
1	1	0	1	11	3	0	2	IŚ	SŚ	OIS										
1	0	0	0	20	4	2	0	0	0	6										
1	1	1	0	32	5	3	3	2	0	12	OIŚ									
1	0	0	0	54	9	4	0	0	0	32	6									
1	1	0	0	87	13	5	7	3	2	60	12	OSŚ								
1	0	0	0	143	18	6	0	0	0	134	32	6	ISŚ							
1	1	1	1	231	24	7	11	4	0	251	60	12	6	OISS						
1	0	0	0	376	35	11	0	0	0	500	122	20	0	24						

(b) Modified version :

0																					
1	I																				
1	1	0I																			
1	0	2	S																		
1	1	3	1	OS																	
1	0	7	0	2	IS	Ś															
1	1	11	0	3	2	1	OIS	OŚ													
1	0	20	0	4	0	0	6	2	IŚ												
1	1	32	1	5	3	0	12	3	2	OIŚ											
1	0	54	0	9	0	0	32	4	0	6	SŚ										
1	1	87	0	13	7	0	60	5	3	12	2	OSŚ									
1	0	143	0	18	0	0	134	6	0	32	0	6	ISŚ								
1	1	231	1	24	11	1	251	7	4	60	0	12	6	OISS							
1	0	376	0	35	0	0	500	11	0	122	0	20	0	24							

6.12. ŚŌḌAŚĀṄGAS – A CRITIQUE

In some of the music books written in the preceding century ‘ŚŌḌaśāṅgas’ (16 Aṅgas) are furnished as mentioned hereunder in a decreasing order of value starting from Kākapāda:

Sl.No.	Aṅga/Saṁyuktāṅga	Units	Sign
1.	Kākapāda	16	+
2.	Pluta-druta-virāma	15	⌘
3.	Pluta-druta	14	⌘
4.	Pluta-virāma	13	⌘
5.	Pluta	12	⌘
6.	Guru-druta-virāma	11	⌘
7.	Guru-druta	10	⌘
8.	Guru-virāma	9	⌘
9.	Guru	8	⌘
10.	Laghu-druta-virāma	7	⌘
11.	Laghu-druta	6	⌘
12.	Laghu-virāma	5	⌘
13.	Laghu	4	|
14.	Druta-virāma	3	⌘
15.	Druta	2	○
16.	Anudruta	1	∪

In the olden days the ‘Virāma,’ having become appended to mostly either to Druta or Laghu and having a fluctuative value of half of the appended Aṅga, was used to be rendered along with the appended Aṅga. In those olden days mostly Caturaśra-jāti was in vogue and this ‘Virāma’ was used to become appended to the Aṅgas pertaining to the Caturaśra-jāti only. But in the later period this ‘Virāma’ was given a fixed value of ‘1’ unit on par with the Anudruta and furnished in these ‘ŚŌḌaśāṅgas’.

Persons having sufficient knowledge of this Tāḷaprastāra can only understand easily that this term ‘ŚŌḌaśāṅgas’ (16 Aṅgas) can be used only in respect of the Aṅgas pertaining to the Caturaśra-jāti and that this term should be modified as ‘Dvādaśāṅgas’ (12-Aṅgas) in respect of the Aṅgas pertaining to the Trisra-jāti, as ‘Viṁśatyāṅgas’ (20-Aṅgas) in respect of the Aṅgas pertaining to the Khaṇḍa-jāti, as ‘Aṣṭāviṁśatyāṅgas’ (28-Aṅgas) in respect of the Aṅgas pertaining to the Miśra-jāti

and as ‘Ṣaḍtriṃśadaṅgas’ (36-A ṅgas) in respect of the Aṅgas pertaining to the Saṅkirṇa-jāti. They can also easily understand that many of them are only Saṁyuktāṅgas used only in Saṁyuktāṅga-prastāra having only the mathematical value but not any rendering value in any Tāla as Aṅgas at all.

For example one of the Saṁyuktāṅgas, ‘Laghu-druta-virāma’ prescribed in the Tāla ‘Śarabhanandana’ (S I O I I O U Ṛ O O O U Ṛ Ṣ Ṭ O U O U O Ṭ O Ṣ Ṛ - 24 A ṅgas, 79 Kriyas) said to have been created by Śyāma Sāstry has to be rendered, in fact, with one ‘Dhruvaka’ (beat) each of the Laghu, Druta and Virāma thus making a total of three beats for a single Aṅga in addition to their respective Niḥśabda-kriyas. But, in our music, as any Aṅga (except Kākapāda) consists of only one beat in the beginning and all the other kriyas, if any, are sound-less, no Aṅga admits more than one beat at all, it is very important to note that Tālas like this ‘Śarabhanandana’ consisting of this kind of Saṁyuktāṅgas are not for rendering at all but for mathematical purpose only.



19. TABLE OF GENERAL PERMUTATION-TRISRAJĀTI-PAÑCĀṄGA
SAID TO HAVE BEEN WRITTEN BY ŚYĀMA ŚĀSTRY HIMSELF
(respective correct figures are furnished in the 2nd line)

Units	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Saṅkhyā	1	2	4	7	13	25	46	86	162	306	561	1066	1114	3728	6175	13041	24407	45651
	1									302	565	1058	1978	3700	6923	12949	24223	45315
Pātāḷa	1	2	5	12	26	56	120	250	517	1012	2163	4372	8715	17600	35068	61620	137750	271734
										1062	2159	4364	8775	17552	34964	69396	137270	270734
Mahāpātāḷa	1	3	8	11	43	95	204	431	100	1857	3803	7721	15606	31340	62645	124701	247327	488161
				19					900		3799	7717	15574	31264	62473	124321	246511	487237

20. SERIAL NUMBERS OF 35 TĀLAS

Sl. No.	Tāḷa & Aṅgas	Name	Value of Jāti	No. of Kriyas	Authentic Sl. Nos.		
					Pañcāṅga	Ṣaḍaṅga	Samyuktāṅga
1	Dhruva - IOII	Maṇi	3	11	-	20	149
2		Śrīkara	4	14	7	25	553
3		Pramāṇa	5	17	-	33	2129
4		Pūrṇa	7	23	-	67	33089
5		Bhuvana	9	29	-	156	525569
6	Maṭhya - IOI	Sāra	3	8	-	5	21
7		Sama	4	10	3	5	41
8		Udaya	5	12	-	5	81
9		Udirṇa	7	16	-	5	321
10		Rāva	9	20	-	5	1281
11	Rupaka - OI	Cakra	3	5	-	1	3
12		Patti	4	6	1	1	3
13		Rāja	5	7	-	1	3
14		Kula	7	9	-	1	3
15		Bindu	9	11	-	1	3
16	Jhampa - IU0	Kadamba	3	6	-	9	13
17		Madhura	4	7	-	8	25
18		Caṇa	5	8	-	10	49
19		Sura	7	10	-	18	193
20		Kara	9	12	-	39	769
21	Tripuṭa - IO0	Śankha	3	7	-	11	21
22		Adi	4	8	5	10	41
23		Duṣkara	5	9	-	8	81
24		Lila	7	11	-	8	321
25		Bhōga	9	13	-	8	1281
26	Āta - II00	Gupta	3	10	-	71	71
27		Lekha	4	12	15	85	649
28		Vidala	5	14	-	110	2577
29		Lōya	7	18	-	233	41025
30		Dhira	9	22	-	555	655617
31	Ēka - I	Sudha	3	3	-	1	1
32		Māna	4	4	1	1	1
33		Rata	5	5	-	1	1
34		Rāga	7	7	-	1	1
35		Vasu	9	9	-	1	1

Chapter - 7

TĀLAS WITH SERIAL NUMBERS

TĀLAS FURNISHED WITH SERIAL NUMBERS

In the annals of our music literature there are only two books on music in which the serial numbers are furnished for the Tālas prescribed in them and they are : 1. Saṅgītasamayāsāra (Sanskrit) and 2. Gāyakalōcanam (Telugu).

The book 'Saṅgītasamayāsāra' is written by Pārśvadēva around 1165 A.D. In it 52 Tālas are furnished along with names, serial numbers and series of Tālāṅgas out of which 25 serial numbers are found incorrect.

The book 'Gāyakalōcanam' is written and published by Taccūr Siṅgarācārya Bros., in 1902. In it 158 Tālas are furnished along with new names, serial numbers and series of Tālāṅgas out of which 43 serial numbers are found incorrect.

All the above mentioned Tālas are furnished here. In respect of the correct or incorrect Tālāṅgas :

- they are shown in brackets if they are originally furnished contrarily than the required
- the correct ones are shown just below the incorrect ones diagonally and
- the newly found correct ones are marked with an asterisk.

For example, in the Tālas of 'Saṅgītasamayāsāra':

- the 14th Tāla 'Maṭṭha' is originally furnished with the incorrect total value of the series of Tālāṅgas of 16-units instead of 8-units and so, the incorrect Tālāṅgas are shown within brackets,
- the serial number '71' and the respective series of Tālāṅgas 'S O O O O S' of the 40th Tāla 'Bindumāli' contradict each other and so, the correct series of Tālāṅgas (O I I O O O S) of the corresponding serial number '71' and the correct serial number (74) of the corresponding series of Tālāṅgas 'S O O O O S' are furnished just below diagonally and
- the corresponding series of Tālāṅgas of the 36th and 37th Tālas 'Nandana and Srīkandarpa' respectively, which are not at all furnished originally in the text, but later found with the help of the easy method 'Naṣṭa', are marked with an asterisk.

In the same manner other correct and incorrect versions could be identified and understood.

7.1 TĀLAS FURNISHED IN "SANGĪTASAMAYASĀRA"

1. Prati	-	5	-	I00 (4 units)
2. Karaṇayati	-	6	-	0000
3. Rati	-	2	-	IS (6 units)
4. Darpaṇa	-	3	-	00S
5. Madana	-	4	-	(00Ś) SI
6. Haṁsal la	-	5	-	II III
7. Kudukka	-	6	-	00II
8. Varṇa	-	15	-	II00
9. Ṣaṭ	-	19	-	000000
10. Rājamrgāṅka	-	2	-	0IS (7 units)
11. Siṁhal la	-	13	-	I000I
12. Rājamārtāṇḍa	-	18	-	SIO
13. Catuh	-	18	-	S000
		28	-	SIO
14. Maṭṭha	-	4	-	(IISSII) (8 units) IIS (also called Udīkṣaṇa)
15. Lalita	-	5	-	00IS (also called Varṇabhinna)
16. Vīravikrama	-	7	-	I00S
17. Raṅga	-	8	-	0000S
18. Gajalīla	-	13	-	(III) III
19. Rājavidyādhara	-	43	-	IS00
20. Mallikāmōda	-	56	-	II0000
21. Ānandavardhana	-	3	-	00IŚ (10 units)
22. Viṣamakaṅkāḷa	-	8	-	ISS
23. Khaṇḍakaṅkāḷa	-	9	-	(00S) 00SS
24. Dheṅki	-	10	-	SIS
25. Mukunda	-	14	-	I00IS
26. Abhinandana	-	21	-	II00S
27. Samakaṅkāḷa	-	28	-	SSI
28. Pūrṇakaṅkāḷa	-	33	-	0000SI
29. Tribhinna	-	2	-	ISŚ (12 units)
30. Kōkilapriya	-	3	-	SIS
		4	-	00SŚ

31.	Udgha ṭa	- 8	- SSS
		22	- I00IṢ
32.	Tribhaṅgi	- 7	- IISS (also called Ratilīla)
		23	- I0IṢ
33.	Cācapuṭa	- 10	- SIIS
		31	- 0S0Ṣ
34.	Kanduka	- 11	- IIIS
		32	- 0II0Ṣ
35.	Śrīkīrti	- 19	- SSII
		107	- 000000Ṣ
36.	Nandana	- 18	- I0000Ṣ*
37.	Śrīkandarpa	- 25	- 0I0SS* (also called Parikrama)
38.	Tryaśravarṇa	- 33	- I00IIS
		35	- 00IIS
39.	Vanamāli	- 60	- 0000I00S
		69	- 00000I0S
40.	Bindumāli	- 71	- S0000S
		74	- 0II000S
41.	Varṇayati	- 2	- IṢṢ (16 units)
42.	Cancapuṭa	- 8	- SSIS
		28	- ISSṢ
43.	Śrīraṅga	- 9	- IISIS
		29	- 00SSṢ
44.	Vijayānanda	- 20	- IISSS
		214	- S00SṢ
45.	Śrōṭṛmaṭṭha	- 23	- SISS
		222	- I000SṢ
46.	Simhan da	- 28	- ISSIS
		278	- SSIS
47.	Anaṅga	- 31	- IṢIIS
		296	- 0I0SIṢ
48.	Jayamaṅgaḷa	- 33	- IISIS
		299	- 0000SIṢ
49.	Pratyaṅga	- 63	- SSSII
		1074	- 00I0I0IṢ
50.	Hamśan da	- 330	- IṢ00Ṣ
		132	- 000II0IIS
51.	Rājacūḍāmaṇi	- 450	- 00ISIṢ
		- 30	- I00I0000IS
52.	Ṣaṭpitāputraka	- 89	- ṢISSIS (24 units)
		2779	- SISISṢ



7.2. TĀḶAS FURNISHED IN "GĀYAKALŌCANAM"

TāḶa consisting of 1½ -Mātras (6-units) :

1. Naṭī - 1 - 0I

TāḶas consisting of 2 - Mātras (8-units) :

2. Naṭanī - 3 - 00I

3. Nartana - 5 - I00

TāḶas consisting of 2½ - Mātras (10-units) :

4. Karamaṇī - 4 - 000I

5. Jayaśrī - 1 - 0S

6. Śrīkari - 3 - I0I

TāḶas consisting of 3 - Mātras (12-units) :

7. Naṭanajñā - 3 - 00S

8. Nāṭyamaṇi - 8 - I00I

9. Naṭanamaṇi - 9 - 0000I

TāḶas consisting of 3½ - Mātras (14-units) :

10. Naṭanīmaṇi - 1 - 00I0I

- 11 - 0Ś

11. Nāṭyajīvi - 3 - I0S

12. Atitvaritā - 12 - 0I00I

13. Pādadhvanī - 9 - S0I

TāḶas consisting of 4 - Mātras (16-units) :

14. Janavinutā - 26 - I0000I

15. Vinōdanaṭanī - 25 - 0I000I

16. Nartanapriyā - 20 - I0I0I

17. Naṭanavinōdī - 8 - 0000S

18. Caraṇaghaṭṭanī - 21 - 000I0I

19. Śrīṅgārakari - 22 - S00I

TāḶas consisting of 4½ - Mātras (18-units) :

20. Śrīkaḷāpriyā - 35 - I00I0I

21. Nartanavinōdī - 12 - I000S

22. Sadānādamaṇi - 37 - 0S00I

23. Karadēśavāsani - 43 - 00I000I

24. Caraṇayugadhvanī - 36 - 0000I0I

25. Janasammōdini - 3 - 00S0I

30 - 000Ś

TāḶas consisting of 5 - Mātras (20-units) :

26. Śaṅkarāhlādinī - 55 - I0S0I

27. Layapariḡrahini - 56 - 000S0I

28. Bharatamunīndravinutā	-	181	-	0000I0000
29. Pādayugaghaṭṭanī	-	65	-	I000I0I
30. Ghaṭṭānādamayī	-	67	-	Ṣ00I
31. Karatāḍanadhvanī	-	63	-	00I0I0I
32. Nandivādyavibhrama	-	151	-	I0I0I00

Tālas consisting of 5½ - Mātras (22-units) :

33. Bhṛṅgīnaṭanapriyā	-	111	-	S00I0I
34. Arjunanirmitāṅgī	-	32	-	I00I0S
35. Trilōkasāncāriṇī	-	95	-	0I0S0I
36. Vilasitapadacāriṇī	-	116	-	000000I0I
37. Divyakusumasāyākī	-	115	-	I0000I0I
38. Nānājanakaramaṇi	-	144	-	S00000I

Tālas consisting of 6 - Mātras (24-units) :

39. Rājēndrasammōdinī	-	172	-	S0S0I
40. Naṭanādaōmkāriṇī	-	174	-	00I0S0I
41. Gandharvōpakāriṇī	-	192	-	(S0I0I) Ṣ0I0I
42. Cidambarēśvaranaṭanī	-	258	-	(0I0I000I) 0I0I0000I
43. Vāsudēvānandinī	-	166	-	I0Ṣ0I
44. Rasikajanānumōdinī	ā	200	-	0000I0I0I
45. Rājarājaprasaṅgī	-	49	-	I0S0S
46. Kinnarabhāmadaraṇā	-	217	-	I00S00I
47. Amarasannutajayaśrī	-	73	-	000I000S
48. Mrdaṅgavādyānukūla	-	365	-	0I0S0I0
49. Haṁs nandagamanī	-	252	-	Ṣ0000I

Tālas consisting of 6½ - Mātras (26-units) :

50. Mēnakātmaṅjāpramōdinī	-	343	-	I0S0I0I
51. Vadhūjanāśrayadhīmaṇi	-	361	-	0I0I00I0I
52. Ānandōtsavadāyini	-	355	-	Ṣ00I0I
53. Anaṅgahrdayāntaraṅgī	-	104	-	0I000I0S
54. Ṣadvidhanāṭyānukāriṇī	-	293	-	I00Ṣ0I
55. Kāḷiyaviṣadharabhēdinī	-	372	-	I000000I0I
56. Gaṅgātaraṅgaśikhariṇī	-	455	-	S0I0000I
57. Padayugavinyastamaṇi	-	304	-	0000Ṣ0I
		294	-	0S0S0I

Tālas consisting of 7 - Mātras (28-units) :

58. Raṁbh nāṭyānukūlinī	-	613	-	SS0I0I
-------------------------	---	-----	---	--------

59. Tāṇḍavasam̐pr tikāriṇī	-	617	-	I00S0I0I
60. Agastyanirmitamōhini	-	552	-	0I0I0S0I
61. Śivakāmavaraprasādini	-	334	-	00I00I0I0I
		634	-	0I0ŚII
62. Mēdiniṅjanasantōṣiṇī	-	557	-	I0I00S0I
63. Tripurāntakaprēmāmaṇī	-	528	-	00I0Ś0I
64. Uttarakanyakābhyāsiṇī	-	553	-	I00I0S0I
65. Anādināṭyaprākāśiṇī	-	616	-	0I0S0I0I
66. Sāhityarasānukūliṇī	-	632	-	S00I0I0I
67. Gajamukhanaṭanasam̐vardhan	-	564	-	0000000S0I
68. Gajagāminiṇīpādayukta	-	155	-	00I0S0S
69. Kāntājanamanōhāriṇī	-	559	-	S000S0I
70. Purandarvaraprabhāmaṇī	-	635	-	0I000I0I0I

Tālas consisting of 7½ - Mātras (30-units) :

71. Virincyānandasvarūpiṇī	-	1093	-	0SS0I0I	
72. Gōpikākriḍāvilāsiṇī	-	1091	-	I0Ś0I0I	
73. Manmadhakēlikāvilōliṇī	-	1124	-	I00I0I0I0I	
74. Atikaṭhinanaṭanasvarūpiṇī	-	1135	-	0000000I0I0I	
75. Vēṇugānasam̐nyukt manī	-	937	-	I0I0Ś0I	
76. Munijanānandapradāyini	ṇ	-	1092	-	000Ś0I0I
77. Sanakasanandanasam̐t ṣiṇī	-	994	-	0000I00S0I	
78. Saṅgītaprabandhavarḍhani	-	1117	-	Ś0I0I0I	

Tālas consisting of 8 - Mātras (32-units) :

79. Sarasvatīgāḷadvanamāliṇī	-	2307	-	0I0I0I00I0I
		2069	-	I0Ś0I00I
80. Hastavinyastakramavādiṇī	-	2306	-	I0Ś00I0I
		2037	-	0IŚ0I00I
81. Nārāyaṇaśam̐kh numōdiṇī	-	1970	-	S00S0I0I
82. Gaurīvallabhanirmitāmaṇī	-	2017	-	Ś00I0I0I
83. Ādibharataśāstrapravīṇatā	-	1974	-	I0000S0I0I
84. Iśvaraprasādajanitanipuṇā	-	2711	-	I0I0I000000I
85. Tāṇḍavakriṣṇamūrṭinaṭanabhara	-	2680	-	I00I0I00000I
86. Sundarāṅganālāsyacāriṇī	-	1968	-	I0I0S0I0I
87. Nartakadhījanahr̥dayaraṅjani	-	2130	-	I00I00000I0I
88. Parabhīkarasvādhīnasulabhini	-	2582	-	(00I00S0000)
				00I00S0000I

89. Bhāmāmaṇipādavivardhanī	-	630 - (S00S00SI) S00S00S
90. Dēvāsuraḥlādōpacāriṇī	-	466 - S0Ṣ0S
91. Kēśavapadāmbhōjānūsaraṇā	-	2420 - I000Ṣ000I
92. Kēraḷavanitāpādasarasiḷā	-	2584 - I0000S0000I
93. Rāmālalāmapādacāriṇī	-	2511 - S0I0I0I0I 2011 - 00S0I0I000I

Tālas consisting of 8½ - Mātras (34-units) :

94. Induṣṣekharatāṇḍavāḍḍambarī	-	3148 - I0I00I0S0I
95. Rāvaṇahastavādyānurāgiṇī	-	3517 - I00I0S0I0I
96. Raṇajabhērīvādyabhayaṁkar	-	3640 - 0000Ṣ00I0I

Tālas consisting of 9 - Mātras (36-units) :

97. Tilōttamāṅghrisarōruhamōdini	-	6601 - 0I0S0I000I0I
98. Saṅgarapadaghaṭṭanaśṛṅgāriṇī	-	5383 - I0000I0Ṣ0I
99. Hanumadbharatalakṣmaṇaprakāśini	-	6443 - 00I000I0I0I0I

Tālas consisting of 10 - Mātras (40-units) :

100. Viśvambharārpitākāratāḷasōbhā	-	5681 - S0I0S0I0S
101. Nāradādimunīndrahṛdayasammōdini	-	18344 - I0I00I0000S0I
102. Śṛīgajagāminiṇipādāruṇabhēdakari	-	24250 - I00I00S00I00I 24105 - SS00I00I00I
103. Kāminiṇjanapāncālasyahṛdīmaṇi	-	21333 - I0I00Ṣ00I0I 20833 - 0Ṣ0S000I0I

Tālas consisting of 12 - Mātras (48-units) :

104. Kālyāṇōtsavasamayōcitavaranaṭyākāriṇī	-	212685 - Ṣ0000I0000I0I0I 212529 - I00I000I00000I0I0I
105. Yamunātīravāsabhāmājanahṛdayamōdini	-	222262 - 00S0I0S00000I0I

TĀLAS PERTAINING TO TRISRA-JĀTI :

106. Guṇī	-	2 - U0
107. Guṇinī	-	3 - UU0
108. Tāṇḍavaśṛī	-	4 - 0UI
109. Nāṭyajnabhūṣaṇā	-	60 - IU0U0
110. Dēvāsurasamōdini	-	99 - IUIU0
111. Śṛṅgāriṇī	-	9 - IU0
112. Surānandini	-	15 - UIU0
113. Naṭanapramōdā	-	11 - UU0UI
114. Nāṭyavinōdā	-	5 - IUI
115. Muniprasaṅgī	-	6 - U0UI

116. Kaḷyāṇaśīlāṅgī	-	4	-	IUŚ
117. Sadānandadāyini	-	19	-	UIU0U0
		109	-	I00I
118. Mādhavāṅghrisarōruha	-	(386)	-	0UIU0U
		195		
119. Vārabhājanasammōdinī	-	1237	-	0UIUUIU0
120. Vēṇuvādyalīlāvinōdinī	-	3040	-	0U0UIU0U0
		2518	-	0UIU0U0U0
121. Gambhīravārāśītaraṅgeṣunāmni	-	498	-	IUIUUII
		1418	-	00IU0II
122. Siṃh ndramadhyamabhūṣaṅgī	-	1449	-	IU0UU0UI
		927	-	UI0IUI0
123. Dundubhivādyamaṇi or Pakṣirājēndrākṛti	-	2690	-	0UŚU0
		2168	-	II0IUU0
124. Paramēśanirmāṇanāmarūpi	-	9264	-	UU0USU0U0
		8742	-	UUU00UUUUU0U0
125. Pārvatīmanōjātanāmakārinī	-	16479	-	0U0USU0U0
		16355	-	UUUUUU0UIU0U0
126. Trisramiśrakhaṇḍasaṅkīrṇayukta	-	485	-	0U0U0UII
		1405	-	I0U00II
127. Bhīṣaṅākārajanitānandānōtsava ā	-	7548211	-	0UŚUUUUUŚU0
		7446592	-	UU0UU0U00SIIU0
128. Atyantasūkṣmamadhyamākṛtiśumō	-	10464	-	IU0U0U0U0UI
		10862	-	UUU0UUUUUU00UI
129. Aṅgajanātyānusaraṅākāramaṇi	-	1174	-	0UUUIUUU0
		9612	-	U00UIUUII
130. Vēdikāmadyaikākṣarī	-	651	-	0UIUIU0
131. Gāruḍapakṣināmamaṇi	-	9824	-	0UUŚUU0
		9302	-	UU0UUU000UU0
132. Dēvēśādisurapramōdinī	-	3514	-	ŚUU0U0U0
		31310	-	U000UUUU0II
133. Brahmādēvanirmitākāramaṇi	-	93352	-	0U0U0UŚU0
		92856	-	00UU0UU0SU0
134. Dēvākṛtiḥamsākṛtīmaṇi	-	1748	-	0UUUIUUU0
		848	-	U0I00UUU
135. Rāsakṛīḍāvinōdinī	-	383	-	SU0U0
136. Rājīvapuṣpaṁ lākṛtisunādā	-	3029	-	IU0UIU0UI
137. Śrīkaṇṭhanātyamōdānukūlā	-	367	-	IUSUI

138. Kalhārasumamālākṛtisubhadrā	-	(7633) - IUUUSUUU 5891
139. Yantralōkālōkādīvyāpārākāriṇī	-	26817 - OUSUSUO 26693 - U000UUUSUO
140. Jājīsukētakīmādhavīsupunnāgamālikāṅgi	-	244668 - IU0UIU0UIU0UI 242910 - UII00IU0UI
141. Śṛṅgārākāraśōbhitaśrīlakṣmī - kaṭākṣavīkṣāmaudā	-	124467 - SSS00UUUU 6368486 - IU00UUUUUU00US
142. Naṭanajanavajrāyudhā	-	1258 - UUUUUUUUIUO
143. Karacaraṇaśabdākāramaṇi	-	27529 - UUUUUŚUUO 17405 - OU0IUUU000U
144. Suravarakinnaramuninutā	-	907 - UUUU0UUUUUO
145. Bhīkaradanujamadaharaṇamusalā	-	5105 - 0UUUUUUUUUUUO 6025 - 0U0U0UIUUO
146. Purandarapriyakriyābhēdanapramōdini	-	203354 - U0U0U0UIU0U0UO 204302 - 00IUU000U0UO
147. Aṅgāntaracaturaśrā	-	51 - IUUUUI
148. Mallayuddhasādhanapramōdā	-	2411 - 0U0U0U0UI 889 - 0S00UO
149. Vikaṭanaṭajanakuṭhārī	-	191 - UUUUUUUUI
150. Viṣamaṇaṇapratāpasēkharī	-	3861 - UUUUU0U0U0UO 4781 - UUUUU0U0UU00
151. Jagadvijayataranaṇanaśēkharī	-	4046 - U0UUUUUUUU0UO 4966 - U0UUUUUUUU00
152. Vilāsalōlākāramaṇi	-	9823 - U0UŚUUO 9301 - 00UUU000UUO
153. Ativiṣadharauragēndrākāriṇī	-	49914 - UUUUUUUUŚUUO 49666 - U0U0UUU0SUO
154. Praḷayakālōddaṇḍacaṇḍamārutākāriṇī	-	1207856 - UUUŚU0U0UIUO 1206456 - IU0UUU0IUU0UIUO
155. Śrīparamamunīndrahṛdayāhlādakāriṇī	-	58541 - 0UUUU0UUUIU0UO 57771 - 0U00UU0U0U0UO
156. Sankrandananandanavaraputra -satīnaṇapriyā	-	733987 - UU0UUUU0UU0UU0UO 731163 - IUUUUU0UIUUU0UO
157. Hamsaturaṅgādīdēvatāpriyā	-	3847 - 0UUIU0U0UO 4767 - 0UUIU0UU00
158. Acyutanāṭyanṛityanartana -vicitralayabrahmajñānī	-	2874397 - 0UU0U0U0UUU0UUSO 2367841 - UU0UŚU00UUUIO

★ ★ ★ ★ ★

21. EXAMPLES OF DIFFERENT PERMUTATIONS

Note : Follow item No.32 of the 'Important technical-terms, abbreviations and signs'.

A. Akhaṇḍa - prastāra

1. 2 - 7 - 33
2. 3 - 6 - 25
3. 4 - 7 - 31
4. 5 - 7 - 26
5. 7 - 8 - 36
6. 9 - 9 - 56 (1,2)
7. 1 - 6 - 32
8. 1 - 6 - 32
9. 1 - 7 - 64

B. Khaṇḍa - prastāra

1. 2 - 9 - 1 - 1 - 28
2. 2 - 12 - 1 - 0 - 29
3. 2 - 8 - 1 - 2 - 25
4. 2 - 8 - 2 - 1 - 21
5. 3 - 10 - 1 - 1 - 32
6. 3 - 12 - 1 - 0 - 23
7. 1 - 8 - 1 - 1 - 26
8. 1 - 8 - 1 - 0 - 13

2-7-33

33	1								0	\$							
32	2								0	I	S						
31	3									I	0	S					
30	4							0	0	0	0	S					
29	5									0	S	I					
28	6							0		I	I	I					
27	7									I	0	I	I				
26	8							0	0	0	0	I	I				
25	9										S	0	I				
24	10									I	I	0	I				
23	11							0	0	I	0	0	I				
22	12							0	I	0	0	0	I				
21	13									I	0	0	0	I			
20	14							0	0	0	0	0	0	I			
19	15	1											\$	0			
18	16	2											I	S	0		
17	17	3							0	0	S				0		
16	18	4									S	I			0		
15	19	5								I	I	I			0		
14	20	6						0	0	I	I				0		
13	21	7						0	I	0	0	I			0		
12	22	8								I	0	0	I		0		
11	23	9						0	0	0	0	0	I		0		
10	24	10	1							0	S				0	0	
9	25	11	2						0	I	I				0	0	
8	26	12	3							I	0	I			0	0	
7	27	13	4					0	0	0	0	I			0	0	
6	28	14	5	1								S			0	0	0
5	29	15	6	2						I	I				0	0	0
4	30	16	7	3					0	0	I				0	0	0
3	31	17	8	4	1					0	I				0	0	0
2	32	18	9	5	2	1						I			0	0	0
1	33	19	10	6	3	2	1	0	0	0	0				0	0	0

3-6-25

1										S
2									I	I
3								U	O	I
4								O	U	I
5							U	U	U	I
6								U	I	O
7								O	O	O
8							U	U	O	O
9								I	U	O
10							U	O	U	O
11								O	U	U
12							U	U	U	U
13	1							O	I	U
14	2						U	U	I	U
15	3							I	O	U
16	4						U	O	O	U
17	5						O	U	O	U
18	6						U	U	U	O
19	7	1					U	I	U	U
20	8	2					O	O	U	U
21	9	3					U	U	O	U
22	10	4	1				I	U	U	U
23	11	5	2				U	O	U	U
24	12	6	3	1			O	U	U	U
25	13	7	4	2	1		U	U	U	U

4-7-31

1									U	O	I					
2										O	U	I				
3									U	U	U	I				
4										U	I	O				
5									U	O	O	O				
6									O	U	O	O				
7								U	U	U	O	O				
8											I	U	O			
9										O	O	U	O			
10								U	U	O	U	O				
11								U	O	U	U	O				
12								O	U	U	U	O				
13								U	U	U	U	U	O			
14	1										O	I	U			
15	2									U	U	I	U			
16	3											I	O	U		
17	4									O	O	O	O	U		
18	5								U	U	O	O	O	U		
19	6								U	O	U	O	O	U		
20	7								O	U	U	O	O	U		
21	8								U	U	U	U	O	U		
22	9	1									U	I	U	U		
23	10	2								U	O	O	U	U		
24	11	3								O	U	O	U	U		
25	12	4								U	U	U	O	U	U	
26	13	5	1										I	U	U	U
27	14	6	2								O	O	U	U	U	U
28	15	7	3							U	U	O	U	U	U	U
29	16	8	4	1							U	O	U	U	U	U
30	17	9	5	2	1							O	U	U	U	U
31	18	10	6	3	2	1							U	U	U	U

5-7-26

1																			O	I				
2																			U	U	I			
3																				I	O			
4																			U	O	O	O		
5																			O	U	O	O		
6																		U	U	U	O	O		
7																			O	O	U	O		
8																		U	U	O	U	O		
9																		U	O	U	U	O		
10																		O	U	U	U	O		
11																		U	U	U	U	O		
12	1																		U	I	U			
13	2																		O	O	O	O		
14	3																	U	U	O	O	U		
15	4																	U	O	U	O	U		
16	5																	O	U	U	O	U		
17	6																	U	U	U	U	O	U	
18	7	1																		I	U	O		
19	8	2																	U	O	O	U	U	
20	9	3																	O	U	O	U	U	
21	10	4																	U	U	U	O	U	U
22	11	5	1																	O	O	U	U	U
23	12	6	2																U	U	O	U	U	U
24	13	7	3	1															U	O	U	U	U	U
25	14	8	4	2	1															O	U	U	U	U
26	15	9	3	5	2	1													U	U	U	U	U	U

9-9-56

1																				I	
2																					U O O O O
3																					O U O O O
4																					U U U O O O
5																					O O U O O
6																					U U O U O O
7																					U O U U O O
8																					O U U U O O
9																					U U U U U O O
10																					O O O U O
11																					U U O O U O
12																					U O U O U O
13																					O U U O U O
14																					U U U U O U O
15																					U O O U U O
16																					O U O U U O
17																					U U U O U U O
18																					O O U U U O
19																					U U O U U U O
20																					U O U U U U O
21																					O U U U U U O
22																					U U U U U U U O
23	1																				O O O O U
24	2																				U U O O O U
25	3																				U O U O O U
26	4																				O U U O O U
27	5																				U U U U O O U
28	6																				U O O U O U
29	7																				O U O U O U

Contd...

30	8									U	U	U	O	U	O	U			
31	9											O	O	U	U	O	U		
32	10									U	U	O	U	U	O	U			
33	11									U	O	U	U	U	O	U			
34	12									O	U	U	U	U	O	U			
35	13									U	U	U	U	U	O	U			
36	14	1										U	O	O	O	U	U		
37	15	2										O	U	O	O	U	U		
38	16	3									U	U	U	O	O	U	U		
39	17	4										O	O	U	O	U	U		
40	18	5									U	U	O	U	O	U	U		
41	19	6									U	O	U	U	O	U	U		
42	20	7									O	U	U	U	O	U	U		
43	21	8									U	U	U	U	O	U	U		
44	22	9	1									O	O	O	U	U	U		
45	23	10	2								U	U	O	O	U	U	U		
46	24	11	3								U	O	U	O	U	U	U		
47	25	12	4								O	U	U	O	U	U	U		
48	26	13	5								U	U	U	U	O	U	U	U	
49	27	14	6	1								U	O	O	U	U	U	U	
50	28	15	7	2								O	U	O	U	U	U	U	
51	29	16	8	3								U	U	U	O	U	U	U	U
52	30	17	9	4	1							O	O	U	U	U	U	U	U
53	31	18	10	5	2							U	U	O	U	U	U	U	U
54	32	19	11	6	3	1						U	O	U	U	U	U	U	U
55	33	20	12	7	4	2	1					O	U	U	U	U	U	U	U
56	34	21	13	8	5	3	2	1				U	U	U	U	U	U	U	U

1-6-32

	<u>3</u>	<u>4</u>	<u>5</u>	<u>7</u> & <u>9</u>
1			Y	88
2	U	U	U	U
3	O	O	O	O
4	U	U	U	U
5	I	O	O	O
6	U	U	O	U
7	O	O	O	O
8	U	U	U	U
9	Y	I	8	8
10	U	U	U	U
11	O	O	O	O
12	U	U	U	U
13	I	O	O	O
14	U	U	U	U
15	O	O	O	O
16	U	U	U	U
17	Y	Y	I	8
18	U	U	U	U
19	O	O	O	O
20	U	U	U	U
21	I	O	O	O
22	U	U	U	U
23	O	O	O	O
24	U	U	U	U
25	Y	I	8	8
26	U	U	U	U
27	O	O	O	O
28	U	U	U	U
29	I	O	O	O
30	U	U	U	U
31	O	O	O	O
32	U	U	U	U

1-7-64

					<u>A</u>	<u>V</u>						<u>A</u>	<u>V</u>									
					7	1	64						6	1	33	32						
					1	6	2	63						1	5	1	34	31				
					2	5	3	62						2	4	1	35	30				
					1	1	5	4	61						1	1	4	1	36	29		
					3	4	5	60						3	3	1	37	28				
					1	2	4	6	59						1	2	3	1	38	27		
					2	1	4	7	58						2	1	3	1	39	26		
1	1	1	1	4	8	57						1	1	1	3	1	40	25				
					4	3	9	56						4	2	1	41	24				
					1	3	3	10	55						1	3	2	1	42	23		
					2	2	3	11	54						2	2	2	1	43	22		
1	1	2	3	12	53						1	1	2	2	1	44	21					
					3	1	3	13	52						3	1	2	1	45	20		
1	2	1	3	14	51						1	2	1	2	1	46	19					
2	1	1	3	15	50						2	1	1	2	1	47	18					
1	1	1	1	3	16	49						1	1	1	1	2	1	48	17			
					5	2	17	48						5	1	1	49	16				
					1	4	2	18	47						1	4	1	1	50	15		
					2	3	2	19	46						2	3	1	1	51	14		
1	1	3	2	20	45						1	1	3	1	1	52	13					
					3	2	2	21	44						3	2	1	1	53	12		
1	2	2	2	22	43						1	2	2	1	1	54	11					
2	1	2	2	23	42						2	1	2	1	1	55	10					
1	1	1	2	2	24	41						1	1	1	2	1	1	56	9			
					4	1	2	25	40						4	1	1	1	57	8		
1	3	1	2	26	39						1	3	1	1	1	58	7					
2	2	1	2	27	38						2	2	1	1	1	59	6					
1	1	2	1	2	28	37						1	1	2	1	1	1	60	5			
					3	1	1	2	29	36						3	1	1	1	1	61	4
1	2	1	1	2	30	35						1	2	1	1	1	1	62	3			
2	1	1	1	2	31	34						2	1	1	1	1	1	63	2			
1	1	1	1	1	2	32	33						1	1	1	1	1	1	64	1		

2-9-1-1-28

2-12-1-0-29

		O +	1			S +	
		O I S	2			I I +	
		I O S	3			S S	
		O S S	4			I S S	
	O	I I S	5			S I S	
	I	O I S	6			I I I S	
		S O S	7			+ S	
	I	I O S	8			I S S	
		O S I	9			S S S	
	O	I S I	10			I I S S	
	I	O S I	11			S I S	
	O	S I I	12			I S I S	
O	I	I I I I	13			S I I S	
I	O	I I I I	14			I I I I S	
	S	O I I I	15	1		I + I	
I	I	O I I I	16	2		S S I	
	S	O I I I	17	3		I I S I	
	I	S O I I	18	4		S S I	
	S	I O I I	19	5		I S S I	
I	I	I O I I	20	6		S I S I	
		+ O I I	21	7		I I I S I	
	I	S O I I	22	8	1	+ I I	
	S	S O I I	23	9	2	I S I I	
	I	I S O I I	24	10	3	S S I I	
	S	I O I I	25	11	4	I I S I I	
	I	S I O I I	26	12	5	S I I I I	
	S	I I O I I	27	13	6	I S I I I	
I	I	I I O I I	28	14	7	S I I I I	
			29	15	8	I I I I I	

2-8-1-2-25

	O	O	§	1	
	O	O	I	S	2
	O	I	O	S	3
	I	O	O	S	4
	O	O	S	I	5
O	O	I	I	I	6
O	I	O	I	I	7
I	O	O	I	I	8
	O	S	O	I	9
O	I	I	O	I	10
I	O	I	O	I	11
	S	O	O	I	12
I	I	O	O	I	13
		O	§	O	14
	O	I	S	O	15
	I	O	S	O	16
	O	S	I	O	17
O	I	I	I	O	18
I	O	I	I	O	19
	S	O	I	O	20
I	I	O	I	O	21
		§	O	O	22
	I	S	O	O	23
	S	I	O	O	24
I	I	I	O	O	25

2-8-2-1-21

				I	§	
	O	O	I	S		
	O	I	O	S		
	I	O	O	S		
				§	I	
	O	O	S	I		
	O	S	O	I		
	S	O	O	I		
O	O	O	O	O	I	
	O	I	S	O		
	I	O	S	O		
	O	S	I	O		
	S	O	I	O		
O	O	O	O	O	I	O
	I	S	O	O		
	S	I	O	O		
O	O	O	O	I	O	O
O	O	O	I	O	O	O
O	O	I	O	O	O	O
O	I	O	O	O	O	O
I	O	O	O	O	O	O

3 - 10 - 1 - 1 - 32

3 - 12 - 1 - 0 - 23

	U	Š	1							+
	U	I	S	2						I Š
	I	U	S	3						S S
	U	S	I	4						I I S
	U	I	I	I	5			O	O	O S
	I	U	I	I	6					Š I
U	O	O	O	I	7					I S I
O	U	O	O	I	8					S I I
O	O	U	O	I	9					I I I I
	S	U	I		10		O	O	O	I I
	I	I	U	I	11		O	O	I	O I
O	O	O	U	I	12		O	I	O	O I
U	O	O	I	O	13			I	O	O O I
O	U	O	I	O	14				O	O S O
O	O	U	I	O	15		O	O	I	I O
U	O	I	O	O	16		O	I	O	I O
O	U	I	O	O	17			I	O	O I O
U	I	O	O	O	18	1			O	S O O
I	U	O	O	O	19	2			O	I I O O
O	I	U	O	O	20	3			I	O I O O
I	O	U	O	O	21	4	1			S O O O
O	O	I	U	O	22	5	2	1		I I O O O
O	I	O	U	O	23	6	3	2	1	O O O O O O
I	O	O	U	O	24					
		Š	U		25					
	I	S	U		26					
	I	I	I	U	27					
O	O	O	I	U	29					
O	O	I	O	U	30					
O	I	O	O	U	31					
I	O	O	O	U	32					

22. TABLES OF DIFFERENT PERMUTATIONS

1.	Caturaśra - Jāti	Pañcāṅga	Table of Akhaṇḍa - prastāra
2.	"	"	Table of Druta
3.	"	"	Table of Laghu
4.	"	"	Table of Guru
5.	"	"	Table of Pluta
6.	"	"	Table of Kākapāda
7.	"	"	Table of Combinative-aṅgas
8.	Trisra - Jāti	Ṣaḍaṅga	Table of Akhaṇḍa - prastāra
9.	"	"	Table of Anudruta
10.	"	"	Table of Druta
11.	"	"	Table of Laghu
12.	"	"	Table of Guru
13.	"	"	Table of Pluta
14.	"	"	Table of Kākapāda
15.	"	"	Table of Combinative-aṅgas
16.	Caturaśra - Jāti	"	Table of Akhaṇḍa - prastāra
17.	"	"	Table of Anudruta
18.	"	"	Table of Druta
19.	"	"	Table of Laghu
20.	"	"	Table of Guru
21.	"	"	Table of Pluta
22.	"	"	Table of Combinative-aṅgas
23.	Khaṇḍa - Jāti	"	Table of Akhaṇḍa - prastāra
24.	"	"	Table of Anudruta
25.	"	"	Table of Druta
26.	"	"	Table of Laghu

27.	Khaṇḍa - Jāti	Ṣaḍaṅga	Table of Guru
28.	"	"	Table of Combinative-aṅgas
29.	Miśra - Jāti	"	Table of Akhaṇḍa - prastāra
30.	"	"	Table of Anudruta
31.	"	"	Table of Druta
32.	"	"	Table of Laghu
33.	"	"	Table of Combinative-aṅgas
34.	Saṅkīrṇa - Jāti	"	Table of Akhaṇḍa - prastāra
35.	"	"	Table of Anudruta
36.	"	"	Table of Druta
37.	"	"	Table of Laghu
38.	"	"	Table of Combinative-aṅgas
39.	All Jātis	Samyuktāṅga	Table of Akhaṇḍa - prastāra
40.	"	"	Table of One Unit
41.	"	"	Table of Two Units
42.	"	"	Table of Three Units
43.	"	"	Table of Four Units
44.	"	"	Table of Five Units
45.	"	"	Table of Six Units
46.	"	"	Table of Seven Units
47.	"	"	Table of Eight Units
48.	"	"	Table of Nine Units
49.	"	"	Table of Ten Units
50.	"	"	Table of Eleven Units
51.	"	"	Table of Twelve Units
52.	"	"	Table of Combinative-units
53.	Combinative table of Pañcāṅga, Ṣaḍaṅga & Samyuktāṅga-prastāras		

1.	1	2	3	4	5	6	7	8	9	10	11	12	
	1	2	3	6	10	19	33	61	108	196	350	632	
	1	3	7	16	34	72	147	299	596	1182	2316	4517	
O	1	2	5	10	22	44	91	180	360	704	1378	2666	
I	0	1	2	5	10	22	44	91	180	360	704	1378	
S	0	0	0	1	2	5	10	22	44	91	180	360	
Ś	0	0	0	0	0	1	2	5	10	22	44	91	
+	0	0	0	0	0	0	0	1	2	5	10	22	
2.												1	12
												12	
											1	0	11
											11	0	
										1	0	11	10
										10	0	121	
									1	0	10	0	9
									9	0	100	0	
								1	0	9	0	54	8
								8	0	81	0	531	
							1	0	8	0	44	0	7
							7	0	64	0	388	0	
						1	0	7	0	35	0	147	6
					6	0	49	0	273	0	1253		
				1	0	6	0	27	0	104	0	5	
				5	0	36	0	183	0	778	0		
			1	0	5	0	20	0	70	0	225	4	
			4	0	25	0	115	0	450	0	1590		
		1	0	4	0	14	0	44	0	129	0	3	
		3	0	16	0	66	0	236	0	771	0		
	1	0	3	0	9	0	25	0	66	0	165	2	
	2	0	9	0	33	0	107	0	321	0	903		
	1	0	2	0	5	0	12	0	28	0	62	1	
	1	0	4	0	13	0	38	0	104	0	268	0	
1	0	1	0	2	0	4	0	8	0	15	0	29	0
	0	1	0	3	0	8	0	20	0	47	0	107	

3.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	6
												6	
										1	6	21	5
										5	36	147	
								1	5	15	35	75	4
								4	25	90	245	585	
						1	4	10	20	39	76	148	3
						3	16	50	120	261	548	1132	
				1	3	6	10	18	33	61	108	189	2
				2	9	24	50	99	195	383	732	1368	
		1	2	3	4	7	12	21	34	56	90	145	1
		1	4	9	16	29	54	101	182	322	560	965	
	1	1	1	2	3	5	7	11	16	24	35	53	0
	1	2	3	5	9	16	27	45	74	121	195	314	
4.												1	3
												3	
								1	3	9	22	51	2
								2	9	33	98	264	
				1	2	5	10	20	38	73	136	255	1
				1	4	13	34	82	184	399	836	1719	
	1	1	2	3	5	8	14	23	40	67	114	192	0
	1	3	7	15	30	59	113	215	403	750	1382	2531	
5.												1	2
												2	
						1	2	5	10	22	44	89	1
						1	4	13	34	86	202	461	
	1	1	2	3	6	10	18	31	56	98	174	306	0
	1	3	7	16	34	71	143	286	562	1096	2114	4054	
6.								1	2	5	10	22	1
								1	4	13	34	86	
	1	1	2	3	6	10	19	33	60	106	191	340	0
	1	3	7	16	34	72	147	298	592	1169	2282	4431	

0																		7.			
1	I																1				
1	1	OI															2				
1	0	2	S														3				
1	1	3	1	OS													4				
1	0	7	0	2	IS	Š											5				
1	1	11	0	3	2	1	OIS	OŠ									6				
1	0	20	0	4	0	0	6	2	IŠ	+							7				
1	1	32	1	5	3	0	12	3	2	1	OIŠ	O+					8				
1	0	54	0	9	0	0	32	4	0	0	6	2	SŠ	I+			9				
1	1	87	0	13	7	0	60	5	3	0	12	3	2	2	OSŠ	OI+			10		
1	0	143	0	18	0	0	134	6	0	0	32	4	0	0	6	6	ISŠ	S+			11
1	1	231	1	24	11	1	251	7	4	0	60	5	0	3	12	12	6	2			12
12	6	2034	3	171	49	2	1693	49	16	0	330	25	0	9	48	48	18	4			

8.	1	2	3	4	5	6	7	8	9	10	11	12		
	1	1	2	4	7	13	25	46	86	162	302	565	1059	
		1	3	8	19	43	95	204	431	900	1857	3799	7718	
U	1	2	5	12	26	56	120	250	517	1062	2159	4364		
O	0	1	2	5	12	26	56	120	250	517	1062	2159		
I	0	0	1	2	5	12	26	56	120	250	517	1062		
S	0	0	0	0	0	1	2	5	12	26	56	120		
Š	0	0	0	0	0	0	0	0	1	2	5	12		
+	0	0	0	0	0	0	0	0	0	0	0	1		
9.												1	12	
												12		
											1	0	11	
											11	0		
										1	0	11	10	
										10	0	121		
									1	0	10	10	9	
									9	0	100	100		
								1	0	9	9	45	8	
								8	0	81	81	450		
								1	0	8	8	36	72	7
								7	0	64	64	324	648	
							1	0	7	7	28	56	119	6
						6	0	49	49	224	448	1029		
					1	0	6	6	21	42	83	168	5	
					5	0	36	36	147	294	631	1344		
				1	0	5	5	15	30	55	105	205	4	
				4	0	25	25	90	180	360	735	1475		
			1	0	4	4	10	20	34	60	115	184	3	
			3	0	16	16	50	100	186	360	705	1216		
		1	0	3	3	6	12	19	30	57	85	141	2	
		2	0	9	9	24	48	83	150	288	467	837		
	1	0	2	2	3	6	9	12	23	32	48	80	1	
	1	0	4	4	9	18	29	48	91	138	234	394		
1	0	1	1	1	2	3	3	6	8	10	17	23	0	
	0	1	1	2	4	6	9	17	24	38	63	92		

10.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	6
												<small>6</small>	
										1	6	21	5
									<small>5</small>	<small>36</small>	<small>147</small>		
								1	5	15	40	100	4
								<small>4</small>	<small>25</small>	<small>90</small>	<small>270</small>	<small>740</small>	
						1	4	10	24	55	116	238	3
						<small>3</small>	<small>16</small>	<small>50</small>	<small>136</small>	<small>345</small>	<small>808</small>	<small>1802</small>	
				1	3	6	13	27	51	97	183	333	2
				<small>2</small>	<small>9</small>	<small>24</small>	<small>59</small>	<small>138</small>	<small>297</small>	<small>617</small>	<small>1257</small>	<small>2484</small>	
		1	2	3	6	11	18	32	56	93	158	268	1
		<small>1</small>	<small>4</small>	<small>9</small>	<small>20</small>	<small>43</small>	<small>84</small>	<small>162</small>	<small>310</small>	<small>573</small>	<small>1046</small>	<small>1898</small>	
	1	1	2	3	4	7	11	16	26	41	62	98	0
	<small>1</small>	<small>2</small>	<small>4</small>	<small>8</small>	<small>14</small>	<small>25</small>	<small>45</small>	<small>77</small>	<small>132</small>	<small>227</small>	<small>382</small>	<small>641</small>	
11.												1	4
												<small>4</small>	
									1	4	14	40	3
									<small>3</small>	<small>16</small>	<small>66</small>	<small>220</small>	
						1	3	9	22	51	111	236	2
						<small>2</small>	<small>9</small>	<small>33</small>	<small>98</small>	<small>264</small>	<small>657</small>	<small>1558</small>	
			1	2	5	10	20	38	73	136	253	466	1
			<small>1</small>	<small>4</small>	<small>13</small>	<small>34</small>	<small>82</small>	<small>184</small>	<small>399</small>	<small>836</small>	<small>1715</small>	<small>3452</small>	
	1	1	2	3	5	8	14	23	39	66	111	187	0
	<small>1</small>	<small>3</small>	<small>7</small>	<small>15</small>	<small>30</small>	<small>59</small>	<small>113</small>	<small>214</small>	<small>400</small>	<small>741</small>	<small>1361</small>	<small>2484</small>	
12.												1	2
												<small>2</small>	
						1	2	5	12	26	56	118	1
						<small>1</small>	<small>4</small>	<small>13</small>	<small>38</small>	<small>100</small>	<small>250</small>	<small>600</small>	
	1	1	2	4	7	13	24	44	81	150	276	509	0
	<small>1</small>	<small>3</small>	<small>8</small>	<small>19</small>	<small>43</small>	<small>94</small>	<small>200</small>	<small>418</small>	<small>862</small>	<small>1757</small>	<small>3549</small>	<small>7116</small>	
13.									1	2	5	12	1
									<small>1</small>	<small>4</small>	<small>13</small>	<small>38</small>	
	1	1	2	4	7	13	25	46	86	161	300	560	0
	<small>1</small>	<small>3</small>	<small>8</small>	<small>19</small>	<small>43</small>	<small>95</small>	<small>204</small>	<small>431</small>	<small>899</small>	<small>1853</small>	<small>3786</small>	<small>7680</small>	
14.												1	1
												<small>1</small>	
	1	1	2	4	7	13	25	46	86	162	302	565	0
	<small>1</small>	<small>3</small>	<small>8</small>	<small>19</small>	<small>43</small>	<small>95</small>	<small>204</small>	<small>431</small>	<small>900</small>	<small>1857</small>	<small>3799</small>	<small>7717</small>	

U																			15.		
1																			1		
1	O																				
1	1	UO	I															2			
2	1																				
1	0	2	1	UI														3			
3	0	4	1																		
1	1	3	0	2	OI													4			
4	2	9	0	4																	
1	0	7	0	3	2	UOI	S											5			
5	0	25	0	9	4																
1	1	11	1	4	0	6	1	US											6		
6	3	49	2	16	0	18	1														
1	0	20	0	8	3	12	0	2	OS									7			
7	0	102	0	34	9	48	0	4													
1	1	32	0	12	3	32	0	3	2	UOS	IS	₱						8			
8	4	189	0	60	9	148	0	9	4												
1	0	54	1	17	4	72	0	4	0	6	2	1	UIS	U₱						9	
9	0	356	3	99	16	378	0	16	0	18	4	1									
1	1	87	0	27	6	152	0	5	3	12	0	0	6	2	OIS	O₱					10
10	5	640	0	170	24	904	0	25	9	48	0	0	18	4							
1	0	143	0	40	9	311	0	6	0	32	0	0	12	3	6	2	UOIS	UO₱	I₱	+	11
11	0	1153	0	278	41	2053	0	36	0	148	0	0	48	9	18	4					
1	1	231	1	58	10	625	1	7	4	60	3	0	20	4	0	0	24	6	2	1	12
12	6	2034	4	444	50	4527	2	49	16	330	9	0	100	16	0	0	96	18	4	1	

16	1	2	3	4	5	6	7	8	9	10	11	12		
	1	1	2	3	6	10	18	31	56	98	174	306	543	
		1	3	7	16	34	71	143	286	562	1096	2114	4055	
U	1	2	5	10	22	44	89	174	342	660	1270	2420		
O	0	1	2	5	10	22	44	89	174	342	660	1270		
I	0	0	0	1	2	5	10	22	44	89	174	342		
S	0	0	0	0	0	0	0	1	2	5	10	22		
Š	0	0	0	0	0	0	0	0	0	0	0	1		
17.												1	12	
												12		
											1	0	11	
											11	0		
										1	0	11	10	
										10	0	121		
									1	0	10	0	9	
									9	0	100	0		
								1	0	9	0	54	8	
								8	0	81	0	531		
							1	0	8	0	44	0	7	
							7	0	64	0	388	0		
						1	0	7	0	35	0	140	6	
						6	0	49	0	273	0	1204		
					1	0	6	0	27	0	98	0	5	
					5	0	36	0	183	0	742	0		
				1	0	5	0	20	0	65	0	195	4	
				4	0	25	0	115	0	425	0	1410		
			1	0	4	0	14	0	40	0	109	0	3	
			3	0	16	0	66	0	220	0	671	0		
		1	0	3	0	9	0	22	0	54	0	123	2	
		2	0	9	0	33	0	98	0	273	0	705		
	1	0	2	0	5	0	10	0	22	0	44	0	1	
	1	0	4	0	13	0	34	0	86	0	202	0		
1	0	1	0	2	0	3	0	6	0	10	0	19	0	
	0	1	0	3	0	7	0	16	0	34	0	72		

18.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	6
												6	
										1	6	21	5
										5	36	147	
								1	5	15	35	75	4
								4	25	90	245	585	
						1	4	10	20	39	76	144	3
						3	16	50	120	261	548	1116	
				1	3	6	10	18	33	58	96	159	2
				2	9	24	50	99	195	374	684	1218	
		1	2	3	4	7	12	19	28	44	70	109	1
		1	4	9	16	29	54	97	164	274	460	767	
1	1	1	1	2	3	4	5	8	12	17	23	34	0
	1	2	3	5	9	15	23	36	58	92	141	216	
19.												1	3
												3	
								1	3	9	22	51	2
								2	9	33	98	264	
				1	2	5	10	20	38	71	130	237	1
				1	4	13	34	82	184	395	818	1653	
1	1	2	3	5	8	13	21	35	57	94	154	254	0
	1	3	7	15	30	58	109	202	369	668	1198	2135	
20.								1	2	5	10	22	1
								1	4	13	34	86	
1	1	2	3	6	10	18	31	55	96	169	296	521	0
	1	3	7	16	34	71	143	285	558	1083	2080	3969	
21.												1	1
												1	
1	1	2	3	6	10	18	31	56	98	174	306	542	0
	1	3	7	16	34	71	143	286	562	1096	2114	4054	

U													22.
1	0											1	
1													
1	1	UO										2	
2	1												
1	0	2	I									3	
3	0	4											
1	1	3	1	UI							4		
4	2	9	1										
1	0	7	0	2	OI						5		
5	0	25	0	4									
1	1	11	0	3	2	UOI					6		
6	3	49	0	9	4								
1	0	20	0	4	0	6	S					7	
7	0	102	0	16	0	18							
1	1	32	1	5	3	12	1	US				8	
8	4	189	2	25	9	48	1						
1	0	54	0	9	0	32	0	2	OS			9	
9	0	356	0	45	0	148	0	4					
1	1	87	0	13	7	60	0	3	2	UOS		10	
10	5	640	0	73	25	330	0	9	4				
1	0	143	0	18	0	134	0	4	0	6	IS	§	11
11	0	1153	0	114	0	802	0	16	0	18			
1	1	231	1	24	11	251	0	5	3	12	2	1	12
12	6	2034	3	171	49	1693	0	25	9	48	4	1	

23	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1	2	3	5	9	15	26	44	75	129	220	377
		1	3	7	15	31	62	122	235	447	842	1572	2916
U	1	2	5	10	20	40	77	148	279	522	971	1792	
O	0	1	2	5	10	20	40	77	148	279	522	971	
I	0	0	0	0	1	2	5	10	20	40	77	148	
S	0	0	0	0	0	0	0	0	0	1	2	5	

24.												1	12
												12	
											1	0	11
											11	0	
										1	0	11	10
										10	0	121	
									1	0	10	0	9
									9	0	100	0	
								1	0	9	0	45	8
								8	0	81	0	450	
							1	0	8	0	36	8	7
							7	0	64	0	324	64	
						1	0	7	0	28	7	84	6
						6	0	49	0	224	49	756	
					1	0	6	0	21	6	56	42	5
					5	0	36	0	147	36	448	294	
				1	0	5	0	15	5	35	30	70	4
				4	0	25	0	90	25	245	180	560	
			1	0	4	0	10	4	20	20	35	60	3
			3	0	16	0	50	16	120	100	245	360	
		1	0	3	0	6	3	10	12	15	30	30	2
		2	0	9	0	24	9	50	48	90	150	180	
	1	0	2	0	3	2	4	6	5	12	11	20	1
	1	0	4	0	9	4	16	18	25	48	49	100	
1	0	1	0	1	1	1	2	1	3	3	4	6	0
	0	1	0	2	1	3	4	4	9	8	16	19	

25.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	6
												6	
										1	6	21	5
									5	36	147		
								1	5	15	35	75	4
								4	25	90	245	560	
						1	4	10	20	35	60	104	3
						3	16	50	120	245	464	856	
				1	3	6	10	15	24	40	66	105	2
				2	9	24	50	90	156	272	474	810	
		1	2	3	4	5	8	13	20	29	40	58	1
		1	4	9	16	25	40	67	112	181	280	428	
	1	1	1	1	2	3	4	5	6	9	13	18	0
	1	2	3	4	6	10	16	24	34	49	73	109	
26.										1	3	9	2
										2	9	33	
					1	2	5	10	20	38	71	130	1
					1	4	13	34	82	184	395	818	
	1	1	2	3	5	8	13	21	34	55	90	146	0
	1	3	7	15	30	58	109	201	365	656	1168	2065	
27.										1	2	5	1
										1	4	13	
	1	1	2	3	5	9	15	26	44	75	128	218	0
	1	3	7	15	31	62	122	235	447	841	1568	2903	

		28.																							
		1	2		3		4		5		6		7		8		9		10		11		12		
						</																			

29.	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1	2	3	5	8	13	22	36	60	99	164	271
		1	3	7	15	30	58	110	205	378	689	1246	2236
U		1	2	5	10	20	38	71	132	241	438	788	1410
O		0	1	2	5	10	20	38	71	132	241	438	788
I		0	0	0	0	0	0	1	2	5	10	20	38

30.													1	12
													12	
											1	0	11	
											11	0		
										1	0	11	10	
										10	0	121		
									1	0	10	0	9	
									9	0	100	0		
								1	0	9	0	45	8	
								8	0	81	0	450		
								1	0	8	0	36	0	7
								7	0	64	0	324	0	
						1	0	7	0	28	0	84	6	
						6	0	49	0	224	0	756		
					1	0	6	0	21	0	56	6	5	
					5	0	36	0	147	0	448	36		
				1	0	5	0	15	0	35	5	70	4	
				4	0	25	0	90	0	245	25	560		
			1	0	4	0	10	0	20	4	35	20	3	
			3	0	16	0	50	0	120	16	245	100		
		1	0	3	0	6	0	10	3	15	12	21	2	
		2	0	9	0	24	0	50	9	90	48	147		
	1	0	2	0	3	0	4	2	5	6	6	12	1	
	1	0	4	0	9	0	16	4	25	18	36	48		
1	0	1	0	1	0	1	1	1	2	1	3	1	0	
	0	1	0	2	0	3	1	4	4	5	9	6		

31.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	6
												6	
										1	6	21	5
									5	36	147		
								1	5	15	35	70	4
								4	25	90	245	560	
						1	4	10	20	35	56	84	3
						3	16	50	120	245	448	756	
				1	3	6	10	15	21	28	39	57	2
				2	9	24	50	90	147	224	333	498	
		1	2	3	4	5	6	7	10	15	22	31	1
		1	4	9	16	25	36	49	68	99	148	221	
	1	1	1	1	1	1	2	3	4	5	6	7	0
	1	2	3	4	5	6	8	12	18	26	36	48	
32.							1	2	5	10	20	38	1
							1	4	13	34	82	184	
	1	1	2	3	5	8	13	21	34	55	89	144	0
	1	3	7	15	30	58	109	201	365	655	1164	2052	

33.		1	2	3	4	5	6	7	8	9	10	11	12
U	1	0											
	1		1										
	1	1	1										
	2	1											
	1	0	2										
	3	0	4										
	1	1	3										
	4	2	9										
	1	0	7										
	5	0	25										
	1	1	11										
	6	3	49										
1	0	20	1										
7	0	102	1										
1	1	32	0	2	OI								
8	4	189	0	4									
1	0	54	0	3	2								
9	0	356	0	9	4								
1	1	87	0	4	0								
10	5	640	0	16	0								
1	0	143	0	5	3								
11	0	1153	0	25	9								
1	1	231	0	6	0								
12	6	2034	0	36	0								

34.	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1	2	3	5	8	13	21	34	56	91	149	243
		1	3	7	15	30	58	109	201	366	659	1177	2086
U		1	2	5	10	20	38	71	130	235	422	750	1326
O		0	1	2	5	10	20	38	71	130	235	422	750
I		0	0	0	0	0	0	0	0	1	2	5	10

35.													1	12
													12	
											1	0	11	
											11	0		
										1	0	11	10	
										10	0	121		
									1	0	10	0	9	
									9	0	100	0		
								1	0	9	0	45	8	
								8	0	81	0	450		
							1	0	8	0	36	0	7	
							7	0	64	0	324	0		
						1	0	7	0	28	0	84	6	
						6	0	49	0	224	0	756		
					1	0	6	0	21	0	56	0	5	
					5	0	36	0	147	0	448	0		
				1	0	5	0	15	0	35	0	70	4	
				4	0	25	0	90	0	245	0	560		
			1	0	4	0	10	0	20	0	35	4	3	
			3	0	16	0	50	0	120	0	245	16		
		1	0	3	0	6	0	10	0	15	3	21	2	
		2	0	9	0	24	0	50	0	90	9	147		
	1	0	2	0	3	0	4	0	5	2	6	6	1	
	1	0	4	0	9	0	16	0	25	4	36	18		
1	0	1	0	1	0	1	0	1	1	1	2	1	0	
	0	1	0	2	0	3	0	4	1	5	4	6		

36.	1	2	3	4	5	6	7	8	9	10	11	12		
												1	6	
												6		
										1	6	21	5	
									5	36	147			
								1	5	15	35	70	4	
								4	25	90	245	560		
						1	4	10	20	35	56	84	3	
						3	16	50	120	245	448	756		
				1	3	6	10	15	21	28	36	45	2	
				2	9	24	50	90	147	224	324	450		
		1	2	3	4	5	6	7	8	9	12	17	1	
		1	4	9	16	25	36	49	64	81	104	139		
	1	1	1	1	1	1	1	1	2	3	4	5	0	
	1	2	3	4	5	6	7	8	10	14	20	28		
37.									1	2	5	10	1	
									1	4	13	34		
	1	1	2	3	5	8	13	21	34	55	89	144	233	0
	1	3	7	15	30	58	109	201	365	655	1164	2052		

U	38.																										
1	0	1		2		3		4		5		6		7		8		9		10		11		12			
1	1	UO		2		4		3		7		11		49		20		102		I		UI		UI			
1	1	1	1	1	0	2	0	4	1	0	25	1	1	11	3	49	1	0	20	7	0	102	1	1	32	1	189
1	1	0	0	356	1	1	0	54	1	1	87	0	2	0	4	10	5	640	0	4	1	0	143	0	3	UOI	9
1	1	1	1	0	1153	0	9	1	1	231	0	4	6	12	6	2034	0	16	18								

39.	1	2	3	4	5	6	7	8	9	10	11	12	
	1	1	2	4	8	16	32	64	128	256	512	1024	2048
	1	3	8	20	48	112	256	576	1280	2816	6144	13312	
	1	1	2	5	12	28	64	144	320	704	1536	3328	7168
	2	0	1	2	5	12	28	64	144	320	704	1536	3328
	3	0	0	1	2	5	12	28	64	144	320	704	1536
	4	0	0	0	1	2	5	12	28	64	144	320	704
	5	0	0	0	0	1	2	5	12	28	64	144	320
	6	0	0	0	0	0	1	2	5	12	28	64	144
	7	0	0	0	0	0	0	1	2	5	12	28	64
	8	0	0	0	0	0	0	0	1	2	5	12	28
	9	0	0	0	0	0	0	0	0	1	2	5	12
	10	0	0	0	0	0	0	0	0	0	1	2	5
	11	0	0	0	0	0	0	0	0	0	0	1	2
	12	0	0	0	0	0	0	0	0	0	0	0	1

40.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	12
												12	
											1	0	11
											11	0	
										1	0	11	10
										10	0	121	
									1	0	10	10	9
									9	0	100	100	
							1	0	9	9	54		8
							8	0	81	81	531		
							1	0	8	8	44	80	7
							7	0	64	64	388	712	
					1	0	7	7	35	63	175		6
					6	0	49	49	273	497	1477		
					1	0	6	6	27	48	125	258	5
					5	0	36	36	183	330	925	1968	
				1	0	5	5	20	35	85	170	360	4
				4	0	25	25	115	205	540	1120	2505	
			1	0	4	4	14	24	54	104	209	404	3
			3	0	16	16	66	116	286	576	1231	2496	
		1	0	3	3	9	15	31	57	108	199	366	2
		2	0	9	9	33	57	131	255	519	1013	1974	
	1	0	2	2	5	8	15	26	46	80	139	240	1
	1	0	4	4	13	22	47	88	170	318	593	1092	
1	0	1	1	2	3	5	8	13	21	34	55	89	0
	0	1	1	3	5	10	18	33	59	105	185	324	
41.												1	6
												6	
										1	6	21	5
										5	36	147	
							1	5	15	40	105		4
							4	25	90	270	765		
					1	4	10	24	59	140	318		3
					3	16	50	136	361	924	2262		
				1	3	6	13	30	66	139	288	591	2
				2	9	24	59	147	354	815	1824	4008	
		1	2	3	6	13	26	50	96	184	350	661	1
		1	4	9	20	47	106	228	480	998	2048	4151	
1	1	1	2	4	7	12	21	37	65	114	200	351	0
	1	2	4	9	19	38	75	147	285	547	1042	1973	

42.	1	2	3	4	5	6	7	8	9	10	11	12	
												1	4
												4	
									1	4	14	40	3
									3	16	66	220	
						1	3	9	22	54	126	290	2
						2	9	33	98	273	714	1804	
			1	2	5	10	22	46	97	200	410	832	1
			1	4	13	34	86	206	483	1102	2470	5444	
	1	1	2	3	6	11	21	39	73	136	254	474	885
		1	3	7	16	35	76	161	337	696	1425	2894	5840
43.												1	3
												3	
								1	3	9	25	63	2
								2	9	33	107	312	
				1	2	5	12	26	58	126	270	575	1
				1	4	13	38	100	254	622	1482	3463	
	1	1	2	4	7	14	27	52	101	195	377	729	1409
		1	3	8	19	44	99	218	474	1017	2161	4555	9534
44.									1	3	9	2	
									2	9	33		
					1	2	5	12	28	62	138	302	1
					1	4	13	38	104	268	670	1630	
	1	1	2	4	8	15	30	59	116	228	449	883	1737
		1	3	8	20	47	108	243	538	1176	2546	5465	11649
45.												1	2
												2	
						1	2	5	12	28	64	142	1
						1	4	13	38	104	272	684	
	1	1	2	4	8	16	31	62	123	244	484	960	1905
		1	3	8	20	48	111	252	563	1242	2712	5872	12626
46.							1	2	5	12	28	64	1
							1	4	13	38	104	272	
	1	1	2	4	8	16	32	63	126	251	500	996	1984
		1	3	8	20	48	112	255	572	1267	2778	6040	13040

47.	1	2	3	4	5	6	7	8	9	10	11	12		
								1	2	5	12	28	1	
								1	4	13	38	104		
	1	1	2	4	8	16	32	64	127	254	507	1012	2020	0
	1	3	8	20	48	112	256	575	1276	2803	6106	13208		
48.									1	2	5	12	1	
									1	4	13	38		
	1	1	2	4	8	16	32	64	128	255	510	1019	2036	0
	1	3	8	20	48	112	256	576	1279	2812	6131	13274		
49.										1	2	5	1	
										1	4	13		
	1	1	2	4	8	16	32	64	128	256	511	1022	2043	0
	1	3	8	20	48	112	256	576	1280	2815	6140	13299		
50.											1	2	1	
											1	4		
	1	1	2	4	8	16	32	64	128	256	512	1023	2046	0
	1	3	8	20	48	112	256	576	1280	2816	6143	13308		
51.												1	1	
												1		
	1	1	2	4	8	16	32	64	128	256	512	1024	2047	0
	1	3	8	20	48	112	256	576	1280	2816	6144	13311		

1																		52.	
1 1	2																	1	
1 2	1 1	1-2	3															2	
1 3	0 0	2 4	1 1	1-3	4												3		
1 4	1 2	3 9	0 0	2 4	1 1	1-4	2-3	5									4		
1 5	0 0	7 25	0 0	3 9	0 0	2 4	2 4	1 1	1-5	2-4	1-2-3	6						5	
1 6	1 3	11 49	1 2	4 16	0 0	3 9	0 0	0 0	2 4	2 4	6 18	1 1	1-6	2-5	3-4	1-2-4	7		6
1 7	0 0	20 102	0 0	8 34	0 0	4 16	3 9	0 0	3 9	0 0	12 48	0 0	2 4	2 4	2 4	6 18	1 1		7
1 8	1 4	32 189	0 0	12 60	1 2	5 25	3 9	0 0	4 16	3 9	32 148	0 0	3 9	0 0	0 0	12 48	0 0		8
1 9	0 0	54 356	1 3	17 99	0 0	9 45	4 16	0 0	5 25	0 0	72 378	0 0	4 16	3 9	0 0	32 148	0 0		9
1 10	1 5	87 640	0 0	27 170	0 0	13 73	6 24	1 2	6 36	7 25	152 904	0 0	5 25	0 0	3 9	60 330	0 0		10
1 11	0 0	143 1153	0 0	40 278	0 0	18 114	9 41	0 0	10 58	0 0	311 2053	0 0	6 36	4 16	3 9	134 802	0 0		11
1 12	1 6	231 2034	1 4	58 444	1 3	24 171	10 50	0 0	14 88	11 49	625 4527	1 2	7 49	3 9	0 0	251 1693	0 0	Contd...	12

1-7	2-6	3-5	1-2-5	1-3-4	8									52 Contd...	
2	2	2	6	6	1	1-8	2-7	3-6	1-2-6	4-5	1-3-5	2-3-4	9		8
4	4	4	18	18	1										
3	0	0	12	12	0	2	2	2	6	2	6	6	1		9
9	0	0	48	48	0	4	4	4	18	4	18	18	1		
4	3	0	32	20	0	3	0	0	12	0	12	0	0		10
16	9	0	148	100	0	9	0	0	48	0	48	0	0		
5	0	3	60	42	0	4	3	0	32	0	20	12	0		11
25	0	9	330	228	0	16	9	0	148	0	100	48	0		
6	4	0	122	84	0	5	0	3	60	0	42	12	0		12
36	16	0	754	492	0	25	0	9	330	0	228	48	0		

Continued below

1-9	2-8	3-7	1-2-7	4-6	1-3-6	1-4-5	2-3-5	1-2-3-4	10													
2	2	2	6	2	6	6	6	24	1	1-10	2-9	3-8	1-2-8	4-7	1-3-7	5-6	1-4-6	2-3-6	2-4-5	1-2-3-5	11	10
4	4	4	18	4	18	18	18	96	1													
3	0	0	12	0	12	12	0	60	0	2	2	2	6	2	6	2	6	6	6	24	1	11
9	0	0	48	0	48	48	0	300	0	4	4	4	18	4	18	4	18	18	18	96	1	
4	3	0	32	0	20	20	12	180	0	3	0	0	12	0	12	0	12	0	0	60	0	12
16	9	0	148	0	100	100	48	1020	0	9	0	0	48	0	48	0	48	0	0	300	0	

Continued below

1-11	2-10	3-9	1-2-9	4-8	1-3-8	5-7	1-4-7	2-3-7	1-5-6	2-4-6	1-2-3-6	3-4-5	1-2-4-5	12							
2	2	2	6	2	6	2	6	6	6	6	24	6	24	1							
4	4	4	18	4	18	4	18	18	18	18	96	18	96	1							

12

	1	2	1-2	3	1-3	4	1-4	2-3	5	1-5	2-4	1-2-3	6	1-6	2-5	3-4	1-2-4	7	53.	
2	1	1	231	-	-	1	24	-	-	-	11	-	1	7	-	-	251	-	Contd... below...	
	12	6	2034			3	171				49		2	49			1693			
3	1	1	231	1	58	-	-	10	-	-	-	625	1	7	-	-	-	-		
	12	6	2034	4	444			50				4527	2	49						
4	1	1	231	-	-	1	24	-	-	-	11	-	-	-	-	-	251	-		
	12	6	2034			3	171				49						1693			
5	1	1	231	-	-	-	-	-	0	14	-	-	-	-	3	-	-	-		-
	12	6	2034						0	88					9					
7	1	1	231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		0
	12	6	2034																	0
9	1	1	231	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		-
	12	6	2034																	
1	1	1	231	1	58	1	24	10	0	14	11	625	1	7	3	0	251	0		
	12	6	2034	4	444	3	171	50	0	88	49	4527	2	49	9	0	1693	0		
	1-7	2-6	3-5	1-2-5	1-3-4	8	1-8	2-7	3-6	1-2-6	4-5	1-3-5	2-3-4	9						
2	-	4	-	-	-	0	5	-	-	60	-	-	-	-						
		16				0	25			330										
3	-	4	-	-	-	-	-	-	3	60	-	-	-	0						
		16							9	330				0						
4	-	-	-	-	-	0	5	-	-	-	-	-	-	-						
						0	25													
5	-	-	-	122	-	-	-	-	-	-	-	-	-	-						
				754																
7	6	-	-	-	-	-	-	0	-	-	-	-	-	-						
	36							0												
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-					0	
																			0	
1	6	4	0	122	84	0	5	0	3	60	0	42	12	0						
	36	16	0	754	492	0	25	0	9	330	0	228	48	0						
																				Contd... below...

GLOSSARY TO THE TECHNICAL-TERMS

Adhaṣṭhita-naṣṭa	: Naṣṭa of the lower permutation from the ‘Middle-number’.
Adhaṣṭhita-prastāra	: Lower permutation from the ‘Middle-number’.
Adhaṣṭhita-uddiṣṭa	: Uddiṣṭa of the lower permutation from the ‘Middle-number’.
Adhikāṅga-saṅkhyā	: Total of the proxies which have originated the superior-aṅgas (SF).
Adhō-pātāḷa	: Synonym of Mahāpātāḷa.
Akhaṇḍa-prastāra	: Synonym of General permutation.
Anāgata	: Division of the element Graha.
Aṅga	: The 4 th element of Tāḷa.
Antya	: Preceding 1 st figure (ultimate).
Anudruta	: Division of the element Aṅga.
Anudruta-mēru	: Table consisting the full details of Anudruta.
Anudrutānta-prastāra	: Permutation ending with Anudruta in the right extreme.
Anulōma-naṣṭa	: Naṣṭa of the obverse-permutation.
Anulōma-prastāra	: Obverse-permutation.
Anulōma-uddiṣṭa	: Uddiṣṭa of the obverse-permutation.
Apatita	: The un-deducted proxy (udp).
Aticitratama	: Division of the element Mārga.
Atīta	: Division of the element Graha.
Āvāpa	: Division of the element Kriya.
Caturaṅga-prastāra	: Quadrivalent-permutation.
Caturaśra-jāti	: Jāti of 4 units.
Caturlaghu	: Synonym of Kākapāda.
Caturmātra	: Synonym of Kākapāda.
Catuṣkaḷa	: Division of the element Kaḷa.
Citra	: Division of the element Mārga.
Citratama	: Division of the element Mārga.
Citratara	: Division of the element Mārga.
Dakṣiṇa	: Division of the element Mārga.
Dēśi-tāḷas	: Tāḷas other than Mārga-tāḷas.
Dēśya-kriyas	: Division of the element Kriya.
Dēśya-śuddha-saṅkīrṇa	: Jāti of 16 units.
Dhruva	: Division of the element Kriya.
Dhruvaka	: Division of the element Kriya.
Divya-saṅkīrṇa	: Jāti of 5 units.
Druta	: Division of the elements Aṅga and Laya.
Druta-mēru	: Table consisting the full details of Druta.
Drutānta-prastāra	: Permutation ending with Druta in the right extreme.
Dvi-kaḷa	: Division of the element Kaḷa.

Ēka-kaḷa	: Division of the element Kaḷa.
Gōpuccha	: Division of the element Yati.
Graha	: The 5 th element of Tāḷa.
Guru	: Division of the element Aṅga.
Guru-mēru	: Table consisting the full details of Guru.
Gurvanta-prastāra	: Permutation ending with Guru in the right extreme.
Hīna-prastāra	: Permutation devoid of a particular Aṅga.
Jāti	: The 6 th element of Tāḷa.
Kākapāda	: Division of the element Aṅga.
Kākapāda-mēru	: Table consisting the full details of Kākapāda.
Kākapādānta-prastāra	: The permutation ending with Kākapāda in the right extreme.
Kāla	: The 1 st element of Tāḷa.
Kaḷa	: The 7 th element of Tāḷa.
Kalita	: The easy method to obtain the full details of all the different Aṅgas upto the required permutation.
Khaṇḍa-jāti	: Jāti of 5 units.
Khaṇḍa-prastāra	: Devisional-permutation.
Kharjūrika	: Division of the element Yati.
Kriṣṇa	: Division of the element Kriya.
Kriya	: The 3 rd element of Tāḷa.
Laghu	: Division of the element Aṅga.
Laghu-mēru	: Table consisting the full details of Laghu.
Laghvanta-prastāra	: Permutation ending with Laghu in the right extreme.
Laya	: 1. Rhythm 2. The 8 th element of Tāḷa.
Madhya	: Division of the element Laya.
Madhyarūpa	: 'Middle-number(MN)' of the permutations.
Madhyarūpa-adhaḥsthita-naṣṭa	: Naṣṭa of the lower permutation from the 'Middle-number'.
Madhyarūpa-adhaḥsthita-uddiṣṭa	: Uddiṣṭa of the lower permutation from the 'Middle-number'.
Madhyarūpa-uparisthita-naṣṭa	: Naṣṭa of the upper permutation from the 'Middle-number'.
Madhyarūpa-uparisthita-uddiṣṭa	: Uddiṣṭa of the upper permutation from the 'Middle-number'.
Mahāpātāḷa	: Total number of all the Aṅgas occur in the process of permutation.
Mārga	: The 2 nd element of Tāḷa
Mārga-kriyas	: Division of the element Kriya.
Mārga-tāḷas	: 1. Caccatpuṭa-SSIṠ 2. Cācatpuṭa-SIIṠ 3. Ṣatpiṭāputraka-ṢISSIṠ 4. Saṃpakv ṣṭāka-ṢSSṠ

	5.Udghaṭṭa-SSS
Mātra	: Division of the element Kaḷa.
Mēru	: Table.
Miśra-jāti	: Jāti of 7 units.
Miśra-dēśya-saṅkīrṇa	: Jāti of 12 units.
Miśramāṅga-prastāra	: Synonym of Saṁyukt āṅga-prastāra.
Miśra-saṅkīrṇa	: Jāti of 8 units.
Miśritāṅga-prastāra	: Synonym of Saṁyukt āṅga-prastāra.
Mṛdaṅga	: Division of the element Yati.
Naṣṭa	: Easy method to obtain the rhythmical form with the help of its serial number.
Nija-prastāra	: Synonym of General-permutation.
Nimēṣa	: Divisional of the element Kāla.
Niṣkrāma	: Division of the element Kriya.
Niḥśabda-kriyas	: Division of the element Kriya.
Ōja	: Odd.
Padmini	: Division of the element Kriya.
Pañcāṅga-prastāra	: Pentavalent-permutation.
Patāka	: Division of the element Kriya.
Pātāḷa	: Total number of the least Aṅgas occur in the process of permutation.
Patita	: Division of the element Kriya.
Pipīlika	: Division of the element Yati.
Pluta	: Division of the element Aṅga.
Pluta-mēru	: Table consisting the full details of Pluta.
Plutānta-prastāra	: Permutation ending with Pluta in the right extreme.
Prastāra	: 1. The 10 th element of Tāḷa. 2. Permutation.
Pravēśa	: Division of the element Kriya.
Proxy	: The serial number of a specified preceding house (Pratinidhi).
Ṣaḍaṅga-prastāra	: Hexavalent or Sexivalent permutation.
Sama	: Division of the elements Graha and Yati.
Samudāyāṅga-mēru	: Name given by Taccūr Siṅgarācārya Bros., to their presumed Saṁy ga-mēru.
Śaṁya	: Division of the element Kriya.
Sa y ga-mēru	: Table consisting the full details of the different combinations of Aṅgas.
Saṁyukt āṅga-prastāra	: Synaptic-permutation.
Saṅkhya	: The total number of permutations.
Saṅkīrṇa-jāti	: Jāti of 9 units.
Sannipāta	: Division of the element Kriya.
Sarpiṇi	: Division of the element Kriya.
Sarva-pātāḷa	: Synonym of Mahāpātāḷa.
Sarva-prastāra	: Synonym of General-permutation.

Saśabda-kriyas	: Divisional of the element Kriya.
Ṣōḍaśāṅga-prastāra	: Incorrect name of Saṅyukt āṅga-prastāra.
Śrōtōvaha	: Division of the element Yati.
Tāḷa	: 1. Rhythmical form 2. Division of the element Kriya.
Tāḷāṅgas	: Limbs of the Tāḷa.
Trisra-jāti	: Jāti of 3 units.
Turīya/Turya	: Preceding 4 th house.
Uddiṣṭa	: Easy method to obtain the serial number with the help of the rhythmical form.
Upāntya	: Preceding 2 nd house (penultimate).
Uparisthita-naṣṭa	: Naṣṭa of the upper permutation.
Uparisthita-prastāra	: Upper permutation.
Uparisthita-uddiṣṭa	: Uddiṣṭa of the upper permutation.
Vārtika	: Division of the element Mārga.
Vēdamadhyama	: Division of the element Yati.
Vikṣēpa	: Division of the element Kriya.
Vikṣipta	: Division of the element Kriya.
Vilambita	: Division of the element Laya.
Vilōma-naṣṭa	: Naṣṭa of the reverse-permutation.
Vilōma-prastāra	: Reverse-permutation.
Vilōma-uddiṣṭa	: Uddiṣṭa of the reverse-permutation.
Viparīta-prastāra	: Synonym of Vilōma-prastāra.
Virāma	: Synonym of Anudruta.
Viśama	: Division of the elements Graha and Yati.
Visarjita	: 1. Division of the element Kriya 2. The proxy to be left-off (lop).
Yathākṣara	: Division of the element Kaḷa.
Yati	: The 9 th element of Tāḷa.
Yavamadhya	: Division of the element Yati.
Yugma	: Even.
Yukta-prastāra	: Permutation containing a particular Aṅga.

a e a e a e a



PROFILE OF

SHRI AKELLA MALLIKARJUNA SHARMA VIOLINIST AND MUSICOLOGIST

Born in 1938, at Mummidivaram, East Godavari district, Andhrapradesh. Shri Akella Mallikarjuna Sharma had his initial training from his father Late Ashwatthanarayana Murthy and later under Shri P.P.Somayajulu. An ardent admirer and follower of Violin Virtuoso, Sangeetha Kalanidhi, Shri M.S.Gopalakrishnan. Shri Mallikarjuna Sharma is one of the few Violinists who adapted his inimitable style of playing the Violin. His close association with Sangeetha Kalanidhi, Shri Nedunuri Krishnamurthy opened up new vistas of traditional Karnataka Music and henceforth became his disciple.

After a short stint as a staff Artist, All India Radio, Hyderabad, he worked for more than two decades as Lecturer in Violin in various Government Colleges of Music & Dance of Andhra Pradesh since 1961. He rendered remarkable service as Principal for 12 years and retired in the year 1996. A strict disciplinarian and a committed teacher, Shri Mallikarjuna Sharma has produced several good students. His duties as a paper setter, valuator and examiner for examinations held in various universities are commendable.

A 'TOP GRADE' Violinist of All India Radio, several of his programmes have been broadcast on AIR and Doordarshan respectively. He has had the privilege of participating in the Akashvani Sangeet Sammelan concerts and the National Programme of Music, AIR, which won him wide acclaim. He has also been a graded Vocal artist of AIR, Hyderabad. He has performed extensively across the country in various prestigious Sabhas including the Music Academy, Madras. He has accompanied several eminent artists of the country. He has several solo programmes to his credit. He has toured the U.K, USA and Canada accompanying Sri Nedunuri Krishnamurthy. He has also toured Singapore as an examiner.

A musicologist of great repute, his contribution to Karnataka Music is laudable. An unparalleled exponent and sole authority on Talaprastara, Shri Mallikarjuna Sharma has unravelled the mysteries of Prastara, one of the Tala Dasha Pranas. His extensive research spanning over four decades brought to light several latent secrets which he discovered all by himself. He has penned a few books. His first book 'Talaprastara Sagara' published in 1985 by the A.P.Sangeet Academy in the year 1985 received the 'Best book' (in the fine arts category) from the Telugu University, Hyderabad. His second book 'Permutative Genius in Tala (Prastara) in Indian music' was the revised version of the first book. In his extensive research he has later modified and re-published these two books in the names of 'Talaprastara Ratnakara' and 'Indian Genius in Talaprastara' respectively. He also published 'Talaprastara of Nisshanka Sharngadeva's Sangeeta Rathnakara - A critical interpretation', under the senior fellowship awarded by the Government of India and 'Systematisation of Prastara Details of Deshi Talas' on Talaprastara itself. His books 'Sangeetha Svararaga Sudha' in Telugu and English have uniquely dealt with the intricacies of Raga Alapana and Svarakalpana. A perfectionist to the core, he has prescribed several Laya exercises which will help students in rendering Svarakalpana. He has sung Svarakalpana exercises along with Alapanas for 36 ragas which are compiled in a mp3 CD and is provided along with the books.

His recent publication, 'Sangeeta Vidyabodhini' is a compilation of compositions notated and sung by him for the benefit of students appearing for the examinations held by the Govt Colleges of Music and Dance (A.P). A set of three mp3 CDs is provided along with this book. The English version of the same is also available. He has published yet another book by name, 'Sangeeta Vidyalochari' (Telugu and English) which is a compilation of notated Krithis/Keerthanas along with two mp3 CDs.

He has extensively toured all the Govt. Music Colleges in the state for two years conducting Lecture-demonstrations and workshops. He has been invited for Lecture-demonstrations and workshops all over the country by various institutions of music. Currently, Shri Mallikarjuna Sharma is teaching several students. In addition, he guides students online for the benefit of those inside and outside the country.

Shri Sharma has worked extensively on teaching methods. Having interacted with several students over scores of years, he has evolved his own teaching methodology and has prescribed several lessons. Though unconventional, his teaching methods are novel, innovative and highly effective. He has designed and produced a set of two mp3 CDs titled, AMS-Easy Methods-2007, which comprises of all the lessons beginning from the basic 'Laya' exercises to the Varnas. This set also contains the definitions of Gamakas with illustrations. The most significant part is the documentation of the Gamakas and hence they are provided with symbols and audio clippings, which are of great help to aspiring students of music. These CDs have been uploaded to <http://www.sangeethamshare.org/chandra/AMS-Easy-Methods-2007/>. In addition, 700 videos available in different playlists have been uploaded to <http://www.youtube.com/user/msakella> for the benefit of the aspirants. His work has been duly recognised and thus, was conferred with the prestigious TTK Award from the Music Academy, Madras for the year 2009, for his contribution to the field of Carnatic music.