


**A STUDY OF EFFECTIVENESS OF ADAPTATION
TECHNIQUE IN TEACHING HISTORY TO CHILDREN WITH
HEARING IMPAIRMENT IN GRADE VII OF ANDHRA
PRADESH STATE EDUCATION BOARD**

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Registration No.08MSD005

A Dissertation Submitted in part fulfillment of Master's Degree
(Master of Special Education)
University of Mysore,
Mysore.

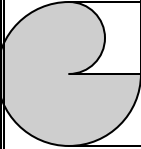
**ALL INDIA INSTITUTE OF SPEECH AND HEARING
MANASAGANGOTTHRI
MYSORE- 570006**

MAY -2009



DEDICATED TO...

*My Lovely Parents, Chellaiah,
Jayamma, Vanamma, Kannaiah
and my family*



Certificate

This is to certify that this Dissertation entitled “**Study of Effectiveness of Adaptation technique in teaching History to Children with Hearing Impairment in Grade VII of Andhra Pradesh State Education Board** ” is a bonafide work in part fulfillment for the degree of Master of Special Education (Hearing Impairment) of the student (Registration No.08MSD005). This has been carried out under the guidance of a faculty of this Institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

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CHAPTER I

INTRODUCTION

1.0 Introduction

“Learning results should be considered in terms of understanding the “big ideas” and core processes within the content standards”

-Wiggins and McTighe (2005)

When typically developing children enter school at the age of three years or more, they have an adequate reserve of functional Language. This serves as a foundation for them to acquire many skills like thinking, understanding, and reasoning and also for acquisition of knowledge. And the school curriculum based on linguistic foundation is planned in such a way as to improve their language and knowledge. It also helps in developing literacy skills, which is one of the important goals of education. But this curriculum may not be directly suitable to Children with Hearing Impairment as they have deficiency in language.

Children with Hearing Impairment many not have age-appropriate receptive and expressive Language if they are not early identified and intervened. This in turn leads to problems in educational process. Hence, these children may have to be taught differently using special methods and techniques to make them understand the concepts meaningfully. This delay also affects the development of various other skills especially the literacy skills. Hence Children With Hearing Impairment has to be trained very early in life for acquiring communication skills and literacy skills. For this, their curriculum should include listening training, Speech and Language training and also all those

activities, which can develop various other skills. It is in this backdrop, the Person with Disabilities Act (1995) has stressed the need for curricular adaptation. It has made provisions for Language exemption, curricular restructuring and adaptation of evaluation strategies.

In reality, the aims and objectives of special education are not different from general education but it must include some additional aims such as development of Language and communication skills and mainstreaming Children With Hearing Impairment. In simple words, special curriculum needs to incorporate all the age appropriate requirements of the children in general and also disability specific special needs.

1.1 The Textbook and the Children with Hearing Impairment

A textbook acts as a guide to the teacher in the teaching-learning process. The content of the textbook should be of good quality. The textbook selected by the teacher should be user friendly, clear and easy to use.

The above points mentioned are applicable to the textbook used by typically developing children. However, Children With Hearing Impairment find it difficult to use the textbooks, because the Language used in the textbook either differs from everyday Language or it is suitable to Language of hearing children. In addition, there are other problems such as presenting too many concepts together, vocabulary load, complex and long sentence structures, usage of too many concrete and abstract words and usage of idiomatic language and figures of speech.

Due to the above-mentioned points, Children With Hearing Impairment are not really interested in using the textbook. Instead they try to produce the words without understanding the actual meaning. In addition to this, they use superficial visual matching while answering the questions.

However problems like unfamiliar vocabulary, out-of-date words and phrases, and specialized vocabulary are some of the problems faced by typically developing children and also Children With Hearing Impairment. As rightly pointed out by Lin Mckeqchie et al (1999), the course of low achievement is the lack of effective teaching learning strategies.

To solve the problems of the textbook and also to make teaching learning process interesting, 'Adaptation technique' can be used. It is a technique, which can be benefit 'differently-abled' children and also 'abled' children. However it should be remembered that adaptation is not changing everything but rather emphasizing the simplicity principle. Adapting is feasible for the classroom teacher because it is relatively unobtrusive, requiring little extra time for special planning, material development, and instruction. (Deschenes, Ebeling and Sprague 1999)

Several writers have described appropriate procedures for adapting curriculum and instruction (Deschenes et al. 1999; Dettmer et al. 2002; Hoover and Patton 1997). The steps they identified can be summarized as:

1. Selecting the subject or topic to be taught;
2. Identifying the specific content to be included;
3. Deciding on the way the lesson will be organized and conducted for most students;

4. Preparing any necessary adaptations (e.g. shorter assignments, easier textbook, extra use of concrete materials).
5. Teaching the lesson, and necessary additional changes while teaching;
6. Providing extra assistance to certain students while the lesson is in progress.

1.2 Importance of using adaptation technique with the Resource materials

The teachers for instructing the students select resource materials. Resource materials include texts, worksheets, exercises, black board notes, and computer software. Some strategies given by James and Brown (1998); Squires (2001) which can be used for adapting the resource materials are as follows:

1. Simplify the language (use short sentences, substitute simple words for difficult terms);
2. Pre-teach any new vocabulary (if a difficult word cannot be simplified, ensure that it is looked at and discussed before students are expected to read it unaided);
3. Provide clear illustrations or diagrams;
4. Improve legibility of print and layout;
5. Remove unnecessary detail;
6. Present information in small blocks of text, rather than dense paragraphs;
7. Use bullet points and lists, rather than paragraphs where possible;
8. Make printed instructions or questions clear and simple'
9. Use cues or prompts where responses are required from the students (e.g. provide the initial letter of the answer, or use dashes to show the number of words required in the answer).

Adaptation technique help children with hearing impairment in understanding the concepts in a more meaningful manner. Adapting resource materials will reduce the language and reading demands and the amount of content the hearing impaired students may find difficult to cover, especially in high school classes in which the reading requirement are substantiated (Sahu, 2005). Adaptation can be made in different areas like the entire curriculum itself or different areas of curriculum like the text book material or resources, teaching strategies, assessment and the text book content.

However Falvey, Givner and Kimm (1996) recommended that adaptations and modifications should not be used unless absolutely necessary and should be faded as soon as possible in order to liberate and not limit student's possibilities.

1.3 Need and Importance of the Study.

In the classroom-teaching situation, educators of children with hearing impairment face a very serious problem, as they have to use the same textbook as that of the typically developing hearing children. Teachers avoid adaptations because it is very time consuming. However, the present research, aims at using the adaptation techniques which will be of some practical use to the teachers.

Simple modifications in teaching style promote the successful learning of students with hearing loss (Lazzari, 1997). However, not many studies have been conducted in these areas for children with hearing impairment. Review of literature in Indian context in these terms needs further investigation. Hence, a need was felt to undertake the present study.

1.3.1 Statement of the Problem

How effective is the adaptation technique in teaching history to children with hearing impairment.

1.3.2 Objectives of the Study

The main aims of the study are

1. To adapt one chapter from history from social studies text-book from Grade-VII, for children with hearing impairment in areas of subject matter, resource materials, teaching strategies and assessments
2. To study the effectiveness of the adaptation technique in teaching children with hearing impairment.

CHAPTER II

REVIEW OF LITERATURE

2.0 Introduction

The review of literature is an important aspect of research report. It highlights the researches already done related to the present problem, which are directly or indirectly related.

The following is the brief summary of previous researches conducted in the area of the present study.

2.1 Studies related to difficulties of children with hearing impairment

2.2 Studies highlighting importance of social studies.

2.3 Studies highlighting importance of various techniques in enhancing the learning process of the student.

2.4 Studies highlighting the need and importance of adaptation technique

2.1 Difficulties of Children with Hearing Impairment

Pollack (1997) Hearing loss has far-reaching, critical effects on childhood development of cognitive (thinking) and linguistic (language) skills. The occurrence of other disabilities in combination with diminished hearing creates "additional learning problems" which significantly add to the complexity of educating the student who is deaf or hard of hearing.

The prevalence of several specific disabilities occurring with diminished hearing has been documented over time (Craig & Craig, 1993, 1983, 1973). The three additional disabilities most often reported in children who are deaf or hard of hearing are learning disabilities, intellectual disabilities, and emotional/ behavioral disabilities.

Paul & Quigley (1990) recommended that students who are deaf or partially hearing impaired have considerable difficulty succeeding in an educational system that depends primarily on the spoken words and written language to transmit knowledge.

Difrancesca (1972) stated very clearly that the deaf children's language deficit is primarily responsible for their retarded educational progress. Progress in school depends increasingly on the ability to read English prose and reading comprehension is proverbially poor among deaf children. Due to their inadequate language ability most deaf children leave school with a 4th to 5th grade reading ability.

Despite recent improvements, very little is known about the special educational needs of children with mild and moderate hearing impairments even though the number of such children is greater than of those classified as severely or profoundly hearing impaired (Maestas y Moores & Moores, 1980).

Ross (1977) estimates that 10% to 20% of the children do not own hearing aids and an additional 10% to 20% never wear the aids they do own.

2.2 Importance of Social Studies

The subject of Social Studies directly deals with the man and society in which he lives.

According to Wesley and Adams (1946) "the term social studies is used to designate the school subjects which deals with human relationships".

Barret et al. (1977) defines Social studies as "An integration of experience and knowledge concerning human relations for the purpose of citizenship education."

According to National Curriculum Framework for school Education, NCERT, 2000 – Social sciences education aims at providing students essential knowledge, skills

and attitude necessary for self development and also for becoming an effective and contributing member of the society.

In the words of Ojha (2001), “the study which helps the learners in understanding the human environment in its totality and developing a broader prospective and an empirical, reasonable and human outlook can be defined as social studies.”

Passe & Beattie (1994) reported that social studies is a subject which needs to be exposed and it is a subject which has been least studied and written about.

Downey (1980) presents the interesting idea of using pictures with historical relevance, often found in history texts, for instructional purposes. Such pictures can add to the students practice in critical thinking and in interpreting visual evidence.

Felton and Allen (1990) recommended the use of visual materials of a historical nature with students who are poor readers, as they may be able to engage in the discussion on a particular topic if reading is not a factor.

According to Babbidge as cited in Corbett (1967), the success in educating and preparing deaf children for full participation in society was very limited due to two major factors, the failure to use experience and research in addressing the basic problems of learning and the failure to develop more systematic and adequate programs for the deaf at all age level.

2.3 Studies highlighting Importance of various techniques in enhancing the learning process of the students.

Teacher the needs of the diverse learners in their class rooms through “differentiated instruction, breaking the curriculum into smaller chunks and curriculum mapping” (Crammer & Nevin, 2007).

Giving students power and control in the classroom can both prevent problematic behaviors and promote higher levels of learning (Apple & Beane, 1995).

Salazar and Nevin (2005) described the implementation of a co – teaching initiative that resulted in an increase in the percentage of children with disabilities who were being effectively educated within their general education class rooms along with children without disabilities.

Tomlinson (1999) encourages the use of instruction by design in curriculum development, instructional delivery, and assessment to facilitate meaningful and effective differentiated instruction not only for students perceived as disabled, at risk, or gifted, but also for “allegedly average” students.

According to Hall (2002), teachers who use differentiated instruction recognize and react responsively to their students varying background knowledge, readiness levels, language skills, preferences in learning, and interests.

The development of practical educational interventions that provide greater-than-usual educational support to accommodate the learning needs of individual students has been a central concern both of effective schooling in general (Brandt, 1985) and of special education services in particular.

Waxman et al (1985) calculated 309 effects from statistical data on approximately 7200 students in kindergarten through grade12. The data were derived from thirty-eight studies of adaptive instruction programs. Of all the comparisons included in the quantitative synthesis to determine positive effects on learning outcomes, 77% were favorable to adaptive instruction; the average weighted effect was.45, which suggests that, under adaptive instruction programs, the average student scored at the 67th percentile of the control group distribution.

According to Dunst (2000), ‘Development-enhancing child learning opportunities are ones that are interesting, engaging, and competency producing and result in a child’s sense of mastery about his or her capabilities’.

Computers are helping people with exceptionalities do almost any thing (M.Rogers, 1989). A professional musician, who is paralyzed, unable to speak or swallow, uses a computer music system to compose and play his work.

It should be noted that differentiation within the classroom addresses not only the needs of students with disabilities or learning problems but also the needs of the most able or gifted students (Kerry and Kerry 1997).

Kameenui and Simmons (1999) recommend that teachers begin to plan for differentiated instructions by focusing on essential core content they would hope all students will learn from the lesson or series of lessons (information, concepts, rules, skills, strategies).

Walberg, (1984). Open education is an even mores radical multivalent model: students are expected to find or create learning materials that suit their individual educational goals.

2.4 Studies highlighting the Need and Importance of Adaptation Technique

Adaptations are most effective when they are simple, easy to develop and implement, and based on typical assignments and activities. Adapting in this way is feasible for the class room teacher because it is relatively unobtrusive, requiring little extra time for special planning, materials development, and /or instruction.

Adaptive instruction programs make use of variety of techniques that have been found to be effective in different classroom settings. These techniques include mastery learning. Co-operative teamwork and individualized instruction (wang&lindvall, 1984). They are used in ways that seem most suitable for each teacher, class, and student, and there is considerable variety in their use among different adaptive instruction programs.

Wang and lindvall (1984) delineate the following distinguishing features of adaptive instruction:

1. Instruction is based on the assessed capabilities of each student.
2. Materials and procedures permit each student to make progress in the mastery of instructional content at a pace suited to his or her abilities and interests.
3. Periodic evaluations of student progress serve to inform individual students of their mastery.
4. Each student assumes responsibility for diagnosing his or her needs and abilities, for evaluating his or her mastery.
5. Alternative activities and material are available to aid students in the acquisition of essential academic skills and content.
6. Students have choices in determining their individual educational goals, outcomes, and activities.

7. Students assist each other in pursuing individual goals, and they co-operate in achieving group goals.

In the simplest of terms, differentiation can be defined as ‘teaching things differently according to observed differences among learners’ (Westwood 2001).

Adaptive teaching is an educational approach that clearly recognizes differences between learners- especially cognitive differences or other specific characteristics. Teachers accept that their students differ in capabilities and take these differences as the starting point for teaching and learning. (Van den Berg, Slegers and Geijsel 2001).

Also, Bigge & Stump (1999) opines the importance of adapting or modifying the curriculum in a way that allows students with disabilities and special education needs to gain knowledge, skills and understanding from it.

Snell & Drake (1994) states that accommodations and modifications is required to enhance learning and acceptance in general education classroom.

Carnine (1997) opines that one of the reasons for low achievement level in mathematics of students with learning disabilities is the mismatch between the students’ learning characteristics and the design of instructional materials and practice. He suggests the use of big ideas, conspicuous strategies, and efficient use of time, clear, explicit instruction on strategies and appropriate practice and review.

Corey (1953) is of the view that if classroom teachers are to make an active research contribute, it will probably be in the area of applied or action research.

Travers (1969) has pointed out some areas of curriculum research which need consideration by researchers in the field at education are of there is concerned with the structure of subject matter

Banks (1992) reports that successful inclusion of students does not normally happen without assistance. Teachers must develop strategies to facilitate the successful inclusion of students with disabilities in general education classroom. Neither regular classroom teachers nor special educators want children with special needs dumped into general educational classrooms.

Mastropieri & Scruggs (1994) reports that for successful inclusion, instruction supports are a key variable in classrooms.

Stainback, Stainback & Wehman (1997) suggested that accommodative supports would benefit not only students with special needs but also normally developing students in the class.

Warnock (1978) states that for the inclusion of deaf children in mainstream school, adapting the curriculum and providing appropriate support, to meet the educational needs

of all children. This then offers children with additional needs, including deaf children, the opportunity to have a same curriculum as their peers.

Fisher et al. (1980), Madaus , Airasian & Kelloghan (1980), states that academic focus means one places highest priority on the assignment and completion of academic tasks. During instruction academic activity is emphasized. Several studies have shown that strong academic focus produces greater student engagement and subsequently good achievement.

Reddy (2008) conducted a study to see the effectiveness of adaptation technique. Fourteen children in Grade VII of English medium school were taken. They were divided into control group and experimental group, and they were taught a lesson using the textbook and adapted materials respectively. Their scores were compared. Experimental group scored high compared to control group and this was attributed to the use of adaptation of technique.

CHAPTER III

METHODOLOGY

3.0 Introduction

The purpose of this study was to see the effectiveness of using adaptation technique in teaching history to children with hearing impairment. The True experimental design (Two groups, Randomized Matched Subjects, Post-test only design) was used. The study was conducted in two phases. First phase included preparing the final draft of the adapted lesson and the teacher made test (Post-test). Second Phase included teaching the children in experimental group with adapted lesson and teaching the children in control group with non-adapted lesson and comparing their scores.

3.1 Description of the Steps used in Phase - I

For the present study, final draft of the adapted lesson was prepared based on the receptive and expressive language ability and also the age of the children. Following steps were used

1. Selection of the lesson from History.
2. Adaptation was in terms of
 - (a) Subject matter
 - (b) Resource materials
 - (c) Teaching strategies
 - (d) Assessments.
3. Preparing the Preliminary draft of the adapted lesson
4. Validation of the Preliminary draft of the adapted lesson
5. Preparing the final draft of the adapted lesson.

Step1: Selection of the lesson from History

A lesson from History from social studies textbook 'Advent of the Mughals' was selected from Grade VII textbook. It is a textbook of Andhra Pradesh State Education Board. After discussion with the concerned school teacher, the present history lesson was selected. The subject social studies was selected because it helps the children to learn about the important past events in the society, contents of the society, environment and about Civic life around them. Even though, social studies is very important subject, usually the social studies textbooks are dull and boring, hence to arouse interest in the learner about the subject, the present adaptation technique was used. The lesson was adapted in such a way that it would inculcate learning in children with hearing impairment.

Generally, children with hearing impairment have linguistic incompetence compared to typically developing children. And the textbook they use is language based. Hence, they find it difficult to comprehend the textbook content, which leads to academic failure. (Appendix 1)

Step2: Adaptation was in terms of

After the selection of the lesson, the contents were adapted in the areas based on the procedure given by Deschenes et al. (1999); Dettermer et al (2000); Hoover and Patton (1997). They are as follows:

(a) Subject matter

The subject matter was adapted on the basis of the procedure given by James and Brown (1998); Squires (2001), which are as follows:

- Simplifying the language: The language of the actual textbook was simplified using short sentences; difficult terms were substituted by simple words wherever necessary.
- Pre-teaching new vocabulary. The new vocabulary in the selected chapter was taught before the actual content was taught.
- Providing clear illustrations or diagrams.
- Presenting information in small blocks of text, rather than in dense paragraphs.
- Using bullet points and lists where ever appropriate.
- Making questions clear and simple
- Highlighting important terms or information by using different fonts and making it bold.

(b) Resource materials

The researcher prepared materials. The adapted resource materials were not of the usual text book type, however the materials were made attractive by using large sheets of paper, attractive fonts, colorful pictures and maps, enlarging the prints, highlighting important points, and use of tables and arrows.

(Appendix 2)

(c) Teaching strategies

While teaching, the teacher re-taught some concepts or information by using simple language, role-play method, use of attractive teaching aids etc.

(d) Assessment

The researcher developed some interesting objective type of assessment like:

1. Fill in the blanks

2. Choose the correct answer
3. Marking True or False
4. Match the following
5. Map Pointing
6. Identify and name the following pictures.
7. Put the tick either in the right or wrong circle.

The assessment sheets were adapted in terms of enlarged print, more space for the students to write the answer, more variety in question type (e.g.; multiple choice, sentence completion, matching formats), and also simple directions were given for answering the questions. (List in Appendix 3).

Step 3: Preparing the preliminary draft of the adapted lesson

While preparing the preliminary draft of the adapted lesson, the instructions given by Deschenes et al. (1999); Dettermer et al (2000); Hoover and Patton (1997) were also taken into consideration

- Specific important concepts were identified in the present history lesson instead of too many concepts and ideas presented together in the textbook, which is not according to the level of the children.
- Textual information is improperly sequenced; hence the lesson was organized in a more systematic way according to the events.

Step 4: Validation

For the purpose of validating, the Preliminary draft of the adapted lesson was given to 5 judges having more than 3 years of experiences in the field of special education of the children with hearing impairment.

The judges were provided with a covering letter, which comprised of

- (a) Introduction of the present research.
- (b) Topic of research study and its objectives.
- (c) A copy of the Preliminary draft of the adapted lesson.
- (d) A copy of the original textbook lesson. (Appendix 4)

Step 5: Preparing the final draft of the adapted lesson.

For preparing the final draft of the adapted lesson, the concepts marked as relevant by more than 80% of the judges were selected. On the basis of the suggestions given by the judges, lesson content was modified and were included in the final adapted lesson.

Preparation of the Teacher made test (Post-test)

The blue print was prepared to give weightage to the lesson. The blue print as shown in the table depicts the distribution of marks given to each of them. The numbers shown within the brackets represents the number of questions and the marks allotted to each question.

Table 3.1

Blue Print

Lesson	Knowledge		Understanding	
	Objective type of Questions	Total	Objective type of Questions	Total
Advent of the Mughals	10 Questions	10 marks	15 Questions	15 Marks

Weightage to the lesson

In the present study, only one lesson ‘Advent of the Mughals’ was selected and it was decided to give 100 % weightage to the lesson selected.

Table 3.2

Weightage to categories under cognitive domain

Categories under cognitive domain	Weightage	Marks
Knowledge	40%	10
Understanding	60%	15
Total	100%	25

From the

above table, it is observed that 40% of the total weightage i.e. 10 marks (out of 25) was given to questions based on knowledge, 60% weightage i.e. 15 marks (out of 25) was given to questions based on understanding.

Once the weightage to the lesson was decided, the Post-test was prepared as follows:

1. Selection of test items (questions).
2. Items in the question paper.
3. Instructions for the students.

1. Selection of test items (questions)

Based on the blue print, the test items (questions) were selected from the content and were matched with the description given in the blue print.

2. Items in the Question paper

Table 3.3.

Items in the question paper

Section	Description	Numbers of Questions.
I	Multiple choice questions	5
II	Fill in the Blanks	5
III	True or False	5
IV	Match the following	5
V	Map pointing and Naming the pictures	5
	Total	25

The above table gives the details of the questions in the test paper. The question paper was divided into 5 sections. Under each section 5 questions were included as mentioned above. (Appendix 5).

3. Instructions for students:

Following instructions were framed and were also verbally explained to the students before they answer the questions

1. All questions are compulsory.

2. Read the questions carefully before trying to answer them.
3. Answers have to be written in space provided in the question sheet.

3.2 Description of the Steps used in Phase II

Participants

Eighteen children with hearing impairment studying in Grade VII from a Telugu medium special school were selected as participants for the present study. For selection of participants, purposive sampling technique was used which included the following criteria:

1. Severe to profound hearing loss.
2. Adequate language level.
3. No additional impairment.
4. Telugu as medium of classroom instruction.
5. Should not have studied the present history lesson (selected for the study) in Social studies in Grade VII either from the school or from any other source.

For the present study, children with hearing impairment in Grade VII were divided into two groups 1) Experimental group, and 2) Control group. These groups were matched on the basis of their social studies and Telugu marks in school examination and also based on their language test administered by the researcher. Language test was administered on children with hearing impairment studying in Grade VII to assess their linguistic ability. This testing was done to bring out deficit in languages, which in turn will reflect on the subject areas of social studies.

The present researcher served as the teacher, and taught the children with hearing impairment. Both the groups were seated separately in two different classrooms. The teacher first taught the experimental group with the adapted material then the control group was taught with the non-adapted materials. They were made to sit separately. The teaching was carried out separately for a duration of 45 minutes each on the same day for both the groups and for a period of 8 days.. The completion of the teaching process was followed by the administration of a 25-mark teacher made test for both the experimental group and the control group. The Post-test was administered to study the effectiveness of the adaptation technique.

3.3 Analysis of the Data

The data collected based on the teacher made test was statistically analyzed to see the effectiveness of the using adaptation technique for teaching. The details are given in the following chapter.

CHAPTER IV

RESULTS AND DISCUSSION

4.0 Introduction

The present study on **‘Effectiveness of adaptation technique in teaching History to children with hearing impairment in Grade VII of Andhra Pradesh State Education Board’** was broadly aimed at adapting a lesson from history textbook and studying the effectiveness of the adapted material on children with hearing impairment.

The study was divided into two parts:

1. Teaching the students with the adapted and the non-adapted material.
2. Assessing the effectiveness of the adapted material.

4.1 Teaching the students from the adapted and the non-adapted material.

For the present study, as mentioned earlier, the group of children with hearing impairment selected was heterogeneous i.e. all the Eighteen children selected for the present study were not similar, they were heterogeneous in many factors like their linguistic ability, speech reading abilities, intelligence and so on. This heterogeneity is quite evident from the table of marks given below.

This table shows their marks in school examination. All the Eighteen children are at different levels of achievement.

Table 4.1

Marks of Students Obtained in School Examination.

No of Students	Marks obtained in social studies examination (Out of 100)	Marks obtained in Telugu examination (Out of 100)
1	36	40
2	38	43
3	53	55
4	55	58
5	54	59
6	70	77
7	50	53
8	72	56
9	68	65
10	35	41
11	52	54
12	55	60
13	37	41
14	49	53
15	51	59
16	65	63
17	60	64
18	71	76

Similarly before the actual study was conducted, the students were given a language test, to assess their language ability. The table below shows their achievement in the language test

Table 4.2. Marks of Students Obtained in Language test

No of Students	Marks obtained in school examination (out of 25)
1	14
2	14
3	16
4	17
5	17
6	19
7	16
8	17
9	18
10	13
11	16
12	16
13	12
14	16
15	16
16	18
17	17
18	17

It is clearly observed from both the tables above, that the selected group was quite heterogeneous. Hence the children with hearing impairment were matched and then they were grouped randomly into control group and experimental group

The following tables give the mean scores of both the experimental and control groups derived from their school examination marks (Social studies and Telugu marks) and the marks obtained from Language test conducted by the researcher.

Table 4.3

Mean and Standard Deviation of School Examination Marks in social studies for Control & Experimental groups.

Groups		N	Mean	Std. Deviation
Social studies Marks in examination	Control	9	52.8889	11.4176
	Experimental	9	52.7778	11.8404

Independent t-test was conducted to test the difference between control and experimental groups for social studies marks in school examination. The following table gives the result of independent t-test.

Table No 4.4:

The Results of Independent t – test.

Social Studies Marks in examination	t	df	p
	.020	16	.984

The marks in examination of the control group and experimental group as shown in the table no.4.3 state that the mean scores of both the groups are 52.8889 and 52.7778 respectively. This indicates no significant difference between both the groups from the independent t– test conducted.

Table 4.5

Mean and Standard Deviation of School Examination Marks in Telugu for Control & Experimental groups.

Groups	N	Mean	Std. Deviation
Telugu Marks in examination Control	9	56.2222	11.0088
Experimental	9	56.7778	11.1555

Independent t-test was conducted to test the difference between control and experimental groups for Telugu marks in school examination. The following table gives the result of independent t-test.

Table No 4.6.

The Results of Independent t – test.

Telugu Marks in examination	t	df	p
	.106	16	.917

The marks in examination of the control group and experimental group as shown in the table no.4.5 state that the mean scores of both the groups are 56.2222 and 56.7778 respectively. This indicates no significant difference between both the groups from the independent t– test conducted.

Similarly marks in language test conducted by the researcher were subjected to independent t-test. The following table gives the mean and standard deviation for control group and experimental group for marks in Language test.

Table 4.7

Mean and Standard Deviation of Language Test marks for Control & Experimental groups.

Groups	N	Mean	Std.Deviation
Marks in Language test Control	9	16.4444	1.6667
Experimental	9	15.6667	1.9365

Independent t-test was conducted to test the difference between control and experimental groups for marks in Language test. The following table gives the result of independent t-test.

Table 4.8

The results of independent t-test. (Language Test)

Marks in Language test	t	df	p
	.913	16	.375

The marks of Language test shown above, the mean scores of the control group and the experimental group is not much different i.e. it is 16.4444 and 15.6667 respectively. This indicates no significant difference between both the groups from the independent t- test.

The results of the tests above indicates that the abilities of students are quite heterogeneous and hence heterogeneity in the achievements. The only similarity they had was that they studied in the same class. So the subjects were randomly assigned to the control group and the experimental group. Hence not much difference between both the experimental group and control group in the school examination marks in Social studies and Telugu and the language test. The control group was taught with the non-adapted material and the experimental group was taught using adapted material.

Assessing the effectiveness of the adaptation technique

Table 4.9: *Marks of control group after group learning from the non-adapted material adapted material*

Students in Control group	Marks obtained after learning from the non-adapted material (out of 25)
1	15
2	16
3	15
4	15
5	16
6	13
7	14
8	8
9	14

Table no 4.10 *Marks of experimental group after learning from the adapted material*

Students in Experimental group	Marks obtained after learning from the adapted material (out of 25)
1	17
2	23
3	21
4	23
5	22
6	20
7	21
8	23
9	24

Table no. 4.9 and table no.4.10 above shows the scores of control group who learnt from the non-adapted material and scores of the experimental group who learnt from the adapted material. There is a vast difference in the achievement of both the groups.

Table 4.11

Mean and the Standard deviation of Control group and Experimental group after learning from the non-adapted and adapted material respectively.

Groups	N	Mean	Std.Deviation
Post-test Marks after teaching			
Control	9	14.0000	2.4495
Experimental	9	21.5556	2.1279

Independent sample test was performed for the comparison of these groups.

Table 4.12

The results of independent t-test.

Post- test Marks after teaching	t	df	p
	6.986	16	.000

Similarly, the mean scores and scores attained in t test can be discussed. As it is seen in the above table that the mean difference between the control group and the experimental group is 14.0000 and 21.5556 respectively, it is quite clear that there is immense variation in the performance of participants in the examination marks after the teaching. The scores on t test also show that there is a significant difference between both the groups.

As the above scores quite clearly indicate that there is an enormous disparity in the achievement of both the groups, the difference in marks can be attributed to the adaptation technique only. It is also evident from the achievement of students in experimental group that the key component for the success of the adapted material owes to the versatility. Here versatility means the teacher used a variety of instructional tools, resources, classroom management techniques and communication strategies to ensure that the students in their classes have access to meaningful learning experiences (Stewart & Kluwin, 2001). They also opined that materials should be age appropriate, interesting and of high quality which meets the needs of the students. All the above factors assessed academic achievement among students.

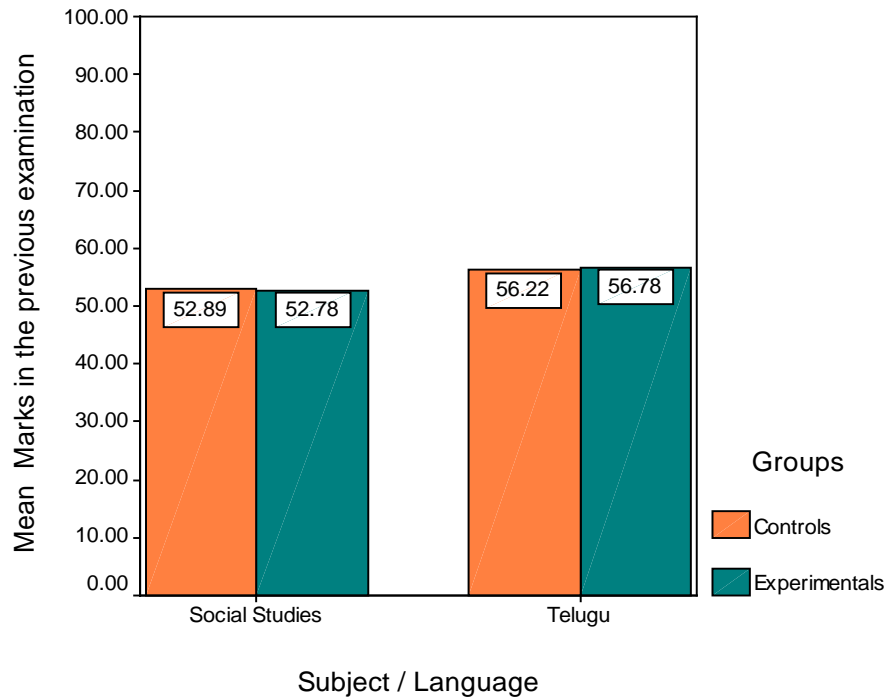


Figure 4.1. Graph for marks of students obtained in the examination.

The above graph shows marks of Social studies and Telugu examination, which do not have significant difference in experimental group and the control group.

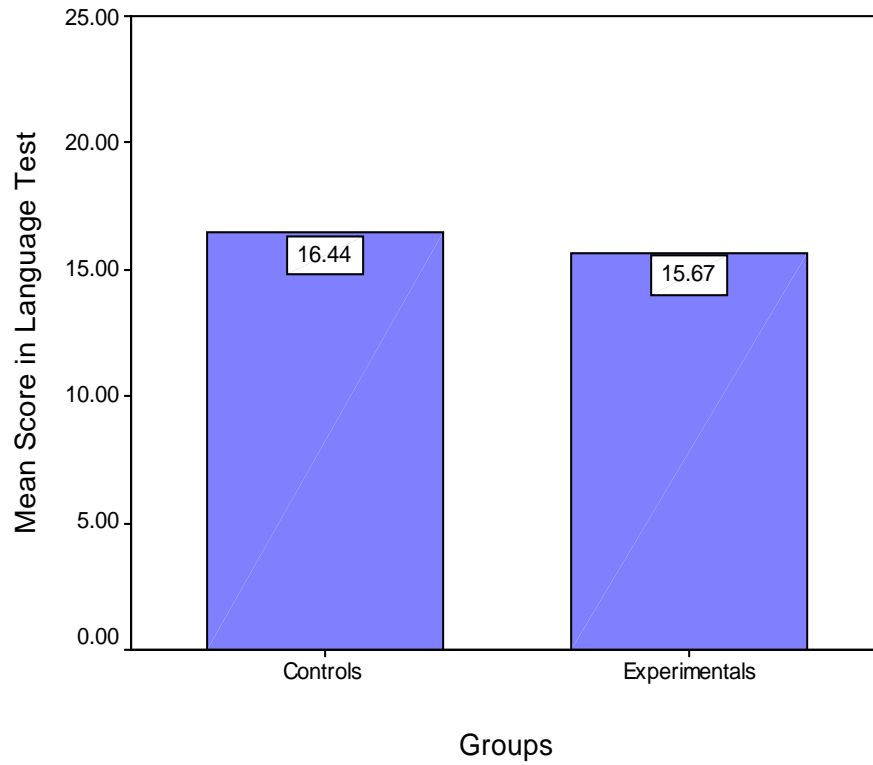


Figure 4.2. Graph for marks obtained by students in Language test conducted by the teacher based on Previous Grade VI

The above graph shows marks in Language test conducted by the researcher, which do not have significant difference in experimental group and the control group.

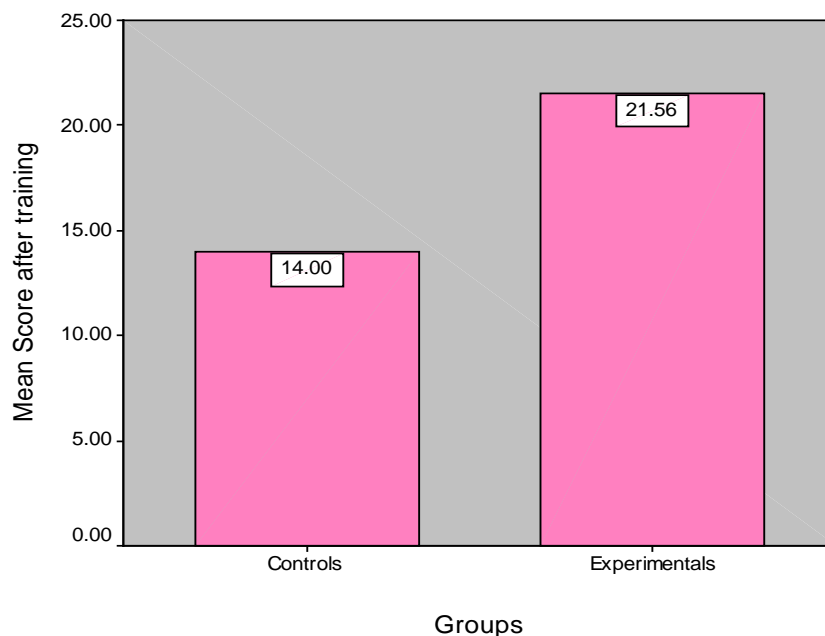


Figure 4.3. Graph for marks obtained by students in Post-test conducted by the teacher after teaching the lesson for control group and Experimental group.

4.2 Discussion highlighting the use of adaptation technique

The marks in examination indicated on the figure 4.1 and marks in the language test indicated on the figure 4.2 shows that there is not much difference between both the groups, however marks after teaching on the figure 4.3, indicates greater difference in the performance levels of both experimental and control groups. Even though there was not much difference in marks of school examination, the improvement in the performance of the experimental group could be attributed to the use of adaptation technique. And the performance of students in control group reveals the difficulty of these children in using

the language-based textbook. Besides it can also be learnt that the textbook materials, the organization, graphics, cueing, clarity, use of examples were lacking or insufficient thus making them difficult to use. Consequently the students did not benefit much from the textbook teaching. As Blosser (1986) affirms the importance of effective material and states that “instructional techniques which help students focus on pre-instructional strategies, increased structure in the verbal content of materials and use of concrete objects are effective in promoting student achievement”.

It is apparent from the bar diagram above that, the experimental group scored well in the examination which was conducted after teaching through the adapted material. This is well observed by the difference of score obtained, 14.00 for the control group and 21.56 for the experimental group. The difference in score can be supported by the opinion of Woodward (1967), which states that when suitable textbooks are not available, teacher prepared material should be used to present key ideas and vocabulary clearly and efficiently. When the experimental group learnt from the adapted materials, the performance was better. Hence it can be concluded that, if adaptation technique is used, it can truly help students to make progress.

CHAPTER V

SUMMARY & CONCLUSION

5.0 Introduction

The present study on **‘Effectiveness of adaptation technique in teaching History to children with hearing impairment in grade VII of Andhra Pradesh State Education Board.’** was aimed at adapting a chapter from the history lesson ‘Advent of the Mughals’ for children with hearing impairment studying in Grade VII of a Telugu medium special school. The selected lesson was adapted in terms of content, resource materials, teaching strategies and assessment.

The main purpose of conducting the present study was to perceive how adaptation technique could benefit children with hearing impairment in the learning process. The rationale behind adapting the lesson is to meet the educational needs of all children with hearing impairment. The adaptation of lesson will provide children with hearing impairment an opportunity to have the same textbooks as that of their hearing peers. An in-depth knowledge of the content can be provided to children with hearing impairment by means of meaningful adaptations, which in turn will widen their interest in learning.

5.1 Objectives of the present Study

1. To adapt a lesson from history from social studies textbook of Grade VII, for children with hearing impairment in areas of subject matter, resource materials, teaching strategies and assessments.
2. To study the effectiveness of the adaptation technique in teaching-learning process of children with hearing impairment.

5.2 Methodology Adapted in Brief

A lesson from History textbook of Grade VII of Andhra Pradesh State education board was selected for the purpose of adaptation. Passe & Beattie (1994) reported that social studies is a subject which needs to be exposed and it is a subject which has been least studied and written about. Hence for the present study, social studies have been selected and an effort is made to make teaching history interesting. The selected chapter was adapted in content, resource material, teaching strategies and assessments.

The appropriate procedure given by Deschenes et al. 1999; Dettermer et al 2000; Hoover and Patton 1997, was taken as a guideline for adaptation for the present study. However before implementing the adapted material, the selected group was divided randomly into two groups namely the control group and the experimental group. The participants in the groups were matched based on their school examination marks and the marks scored in language test. The control group was taught from the usual textbook material and the experimental group was taught from the adapted material for duration of 45 minutes each separately for a period of Eight days. After the completion of the teaching, a twenty-five-mark teacher made test (post-test) was administered on both the control and the experimental groups. The marks of both the groups were compared to study the effectiveness of the adapted material.

5.3 Findings obtained based on the analysis of the data

1. The marks in social studies examination of the control group and the experimental group state that the mean scores of both the groups are 52.889 and 52.7778 respectively. The marks in telugu examination of the control group and the experimental group state

that the mean scores of both the groups are 56.2222 and 56.7778 respectively. This indicates that there was no significant difference between both the groups from the independent t test conducted.

2. The marks in language test also reveal that there was no significant difference between both the groups.
3. The mean scores of 14.00 for the control group and 21.56 for the experimental group after learning through the non-adapted and the adapted material respectively show the enormous disparity in the performance. The good performance of the experimental group could be attributed to the effective adapted material.

In conclusion it can be said that adaptation is a very useful technique which when well planned will certainly benefit all pupils. It is a solution to the dull and boring textbook, however it should be remembered that the material for adaptation should be acceptable otherwise it is unlikely to be useful.

5.4 Limitations of the Study

1. Only one lesson from Grade VII history textbook was selected.
2. Participants from only one special school for children with hearing impairment were selected for the study.
3. Only written materials were used as instructional materials for the present study.
4. Reliability of the adapted lesson and the test were not carried out due to lack of time.

5.5 Recommendations

➤ *For Research Students*

1. In other school subjects also, studies of similar type can be conducted.
2. For other topics of history, similar studies can be carried out.
3. Adaptation technique can also be tried for topics in Geography, Civics and Economics.
4. In different languages, at different grade levels and for different Education boards, similar type of studies could be conducted.
5. Participants from different special schools can be taken.

➤ *For Teachers*

1. Teachers can develop adapted instructional materials of similar type for those students who cannot benefit from the language- based textbook.
2. Teachers can systematically develop adapted materials for various difficult topics to supplement their teaching learning process.
3. The teachers should be prepared for effective use of adaptation technique.
4. Teachers can also focus on developing computer assisted adapted materials which are of audio-visual nature.

REFERENCES

- Apple, M., & Beane, J.(1995). *Democratic Schools*. Alexandria, VA: Association for *supervision and curriculum development*.
- Babbidge, H. D. (1967). 'Education of the deaf. The challenge and the charge', In Edward. E. Corbett, Jr. In Martin, D. S; (Ed) (1987), *Cognition, Education and Deafness*. Gallaudet University Press. Washington. D.C, (19).
- Banks, J. (1992). *Acomment on "Teacher perception of the regular education initiative."* *Exceptional children*. In Smith, T.E.C (2001).*Teaching students with Special Needs in Inclusive settings (3 Ed)*. Boston: Allyn and Bacon.
- Bench, R.J., (1992) *Communication skills in Hearing impaired children*, London. Whurr Publishers Ltd.
- Barr et al (1977). *The International Encyclopedia Of Education*. Penguin Press New York, 1985, P. 4649.
- Bigge, J. L. & Stump, C. S. (1999). *Curriculum, assessment, and instruction for students with disabilities*. Belmont, CA: Wadsworth publishing company. In Polloway, E. A., Patton. R., Serna,L.(2001).*Strategies for teaching learners with special needs (seventh Edition)*. New Jersey. U.S.A.: Prentice-Hall, Inc Upper saddle River.
- Blosser, P.E.(1986).*What research says: Improving science education. School science and mathematics*. In Polloway, E. A., Patton, J. R., Serna, L. (2001).*Strategies for teaching learners with special needs (seventh Edition)*. New Jersey. U.S.A.: Prentice-Hall, Inc Upper saddle River.
- Brandt, R.S.(1985) success though adaptive education, educational leadership, 43,3.

- Carnine, D. (1997). *Instructional design in mathematics for students with learning disabilities. Journal of Learning Disabilities. In Gowramma.I.P. (2005).Development of Remedial Instruction Programme for Children with Dyscalculia in primary school. Mysore: Chethana Book House.*
- Corey, StephenM.(1953).*Action Research to Improve School Practices. NewYork; Teachers College, Columbia University.*
- Craig, W.N. & Craig, H.B. (Eds.). (1973). Tabular summary of schools and classes in the U.S. American Annals of the Deaf, 118(2), 134-135.
- Craig, W.N. & Craig, H.B. (Eds.). (1983). Tabular summary of schools and classes in the U.S. American Annals of the Deaf, 127(2), 188-189.
- Craig, W.N. & Craig, H.B. (Eds.).(1993). Tabular summary of schools and classes in the U.S. American Annals of the Deaf, 138(2), 169-170.
- Crammer, E.D., & Nevin, A.I. (2007). *A mixed methodology analysis of Co – teacher assessments: Implications for teacher education. Teacher education and Special education, 30(1).*
- Deschenes, C., Ebeling, D. and Sprague, J. (1999). *Adapting the curriculum in inclusive classrooms. New York: National Professionals resources. Cited in Westwood, P.(2003).Commonsense methods for children with special educational needs, strategies for regular classroom. London, RoutledgeFalmer, 204.*
- Dettermer, P. et al (2000) *Consultation, Collaboration and Team work for students with special Needs, Boston, MA: Allyn & Bacon. In Westwood, P. (2003) commonsense methods for children with special educational need .Strategies for the regular classroom. Landon: Routledge Falmer.*

Difrancesca, (1972). As cited in Kauffman, J. M., & Hallahan, D. P (1981) Hand book of special education. NJ. Prentice Hall, INC. Englewood cliffs.

Downey, M.T. (1980). Pictures as teaching aids: Using the pictures in history textbooks. Social Education. In Polloway, E. A., Patton, J. R., Serna, L.(2001).Strategies for teaching learners with special needs (seventh Edition). New Jersey. U.S.A.: Prentice-Hall, Inc Upper saddle River.

Dunst, C.J.(2000). Revisiting “Rethinking early intervention.” Topics in early child hood special education, 20 (2), 95-103.

Falvey, M.A., Givner, C.C. & Kimm, C. (1996) “What do I do Monday morning?’ In S. Stainback & W. Stainback (Eds) Inclusion: A guide for educators, Baltimore, MD: Brookes. In Westwood, P. (2003) commonsense methods for children with special educational need .Strategies for the regular classroom. Landon: Routledge Falmer. 206.

Felton, R. G., & Allen, R. F. (1990).Using visual materials as Historical sources. The Social Studies. In Polloway, E.A., Patton, J. R., Serna, L.(2001).Strategies for teaching learners with special needs (seventh Edition). New Jersey. U.S.A.: Prentice-Hall, Inc Upper saddle River.

Fisher et al. (1980).Teaching behaviors, Academic learning and Student achievement. An overview & Madaus, G. F., Airason, P. W., Kellagahn, T. (1980).School Effectiveness: An overview of the evidence. In Joyce, B. & Weil, M.(1996) Boston: Allyn & Bacon. (31-44).

Hall, T., (2002). Differentiated Instruction. CAST: National center on accessing the general curriculum: effective classroom practice report. Retrieved June 5,2006, from <http://www.cast.Org/ncac/index.Cfm?%=2876>.

Hoover, J. & Patton, J. (1997) *Curriculum Adaptations for Students with Learning and Behavior Problems (2nd Edn)*, Austin, TX: Pro Ed. In Westwood, P. (2003) *commonsense methods for children with special educational need .Strategies for the regular classroom. Landon: Routledge Falmer.*

James, F. & Brown, K. (1998) *Effective Differentiation*, London: Collons. In Westwood, P. (2003) *commonsense methods for children with special educational need .Strategies for the regular classroom. Landon: Routledge Falmer.*

Kerry&Kerry(1997). *Integrating pupils with Disabilities in main stream schools*, London: fulton.

Lazzari, A. M. (1997). *Exceeding the Boundaries. Understanding exceptional lives .U.S.A., Harcourt Brace & Company.*

Leverett, R. G., & Diefendorf, A. O. (1992) '*Suggestions for frustrated teachers. Teaching Exceptional Children*', as cited Smith et al.(2001) *Teaching students with special needs in inclusive settings, Boston, Allyn & Bacon.*

Maestas Y Moores, J., & Moores, D.educational alternatives for the hearing impaired, In M. Nerbonne & R.schow (eds.), *introduction to aural rehabilitation: Baltimore: university park press,1980.*

Mastropieri, M. A., & Scruggs, T. E. (1994). Effective Instruction for Special Education (2 ed). Austin, TX: Pro-Ed. In Smith, T. E.C (2001).Teaching students with Special Needs in Inclusive settings (3 ed). Boston: Allyn and Bacon.

National Curriculum Framework for School Education, NCERT, New Delhi, 2000.

Ojha, N.C. (2001). Understanding teaching of Social Studies. Madhya Pradesh Bhoj (Open) University.

Passe, J;& Beattie, J.(1994). Social studies instruction for students with mild disabilities: A progress report. Remedial and Special Education, 15, 227-233. In Polloway, E. A., Patton, J. R., Serna,L.(2001).Strategies for teaching learners with special needs (seventh Edition). New Jersey. U.S.A.: Prentice-Hall, Inc Upper saddle River.

Paul, P. V., & Quigley, S.P(1990).Education and Deafness. White Plains, NY: Longman.

In Gargiulo, R. M.(2003).Special education in contemporary society. An introduction to exceptionality. U.S.A. Wadsworth/Thomson learning, 401-425.

Persons with disability Act (1995), New Delhi.

Pollack. B.J. (1997). Educating Children Who Are Deaf or Hard of Hearing: Additional Learning Problems.

Reddy (2008). ‘Study of effectiveness of using adapted curriculum to teach history for high school children with hearing impairment’ Unpublished Dissertation University of Mysore.

Roger .M (1989).Technology: More than wheelchairs. Newsweek, 66-67.

Ross,M.(1977) Definitions and descriptions. In J.Davis (ed.), our forgotten children: Hard of hearing pupils in the schools. Minneapolis: university of Minnesota,

- Sahu, S.M. (2005) Education of children with special Needs, Delhi, Anmol Publications.*
- Salazar, L., & Nevin, A. (2005). Co – Teachers in an urban multi cultural school. Florida Educational leadership, 5(2), 15-20.*
- Simmons, D. & Kammenui, E. J. (1999). Toward successful inclusion of students with disabilities. The architecture of instruction. Reston, VA: Council for Exceptional children. In Westwood, P. (2004). Common sense methods for children with special educational needs: Strategies for the regular classroom. (4th Ed). London, RoutledgeFalmer.*
- Snell, M. & Brake. G. P.(1994). Replacing cascades with supported education. Journal of Special Education. In Smith, T. E.C (2001). Teaching students with Special Needs in Inclusive settings (3 ed). Boston: Allyn and Bacon.*
- Squires, G.(2001) “ Dyslexia: strategies for support’, special children. In Westwood, P. (2003) commonsense methods for children with special educational need .Strategies for the regular classroom. Landon: Routledge Falmer.*
- Stainback, W. C., Stainback, S. & Wehman, P.(1997). Toward full inclusion into general education. In Wehman, P. (Ed). In Smith, T. E.C (2001). Teaching students with Special Needs in Inclusive settings (3 Ed). Boston: Allyn and Bacon.*
- Stewart, D. A. & Kluwin, T. N. (2001). Teaching Deaf and Hard of Hearing students: Content, Strategies and Curriculum, Boston: MA: Allyn and Bacon.*
- Tomlinson, C.A. (1999). The differentiated classroom: responding to the needs of all learners. Alexandria, VA: Association for supervision and curriculum development.*

- Travers, Robert M.W.(1969)AN Introduction to Educational Research. NewYork; The Macmillan Company.*
- Vandenberg, R., sleepers, p. and Geijsel, F.(2001) 'Teachers' concerns about adaptive teaching: evaluation of a support program; journal of curriculum and supervision, 16,3: 245-58.
- Walberg, H.J.(1984).Improving the productivity of America's school. Educational leadership, 41 (8), 19-30.
- Wang, M.C& Lindvall, C.M.(1984). Individuai differences and school learning environment: theory, research, and design: InE.W. Gordon (ed), review of research in education(VOL.11,PP.161-226).
- Warnock (1978).In Kopp, H. G. (1968). Curriculum Cognition and Content. Alexander Graham Bell Association for the Deaf Inc.*
- Waxman, H.C., & Walberg, H. J.(1982). The relation of teaching and learning: a review of reviews. Contemporary education review, 2, 103-120.
- Wesley, A and Adams, M.A. (1946).Teaching Social Studies In Elementary Schools, Health and Co. Boston D.C.*
- West Wood, (2001) 'Common sense method for children eith special educational needs', Thread edition.*
- Wiggins, G., & MCTighe, J. (2005). Understanding by design (2nd Ed., expanded). Alexandria,VA: Association for supervision and curriculum development.*
- Woodward, H. (1967). Kopp, H. G. (1968). In Curriculum Cognition and Content. Alexander Graham Bell Association for the Deaf Inc.*

PRE-LANGUAGE TEST

dç'²à

El, i±¹/₄æ Èp±µÀ:

hÈl¹/₄:

hµ±µSµi:

q₃ em*iv Èp±µÀ:

ÈçÀÀhµò

¶çÃ±µÀövÀ: 25

I. F0²ñol¹/₄ ç, d²vñ ¶²±¹/₄Ë±Àç, À¶m ¶²¶çÀlû, ¶m¶çÀvÀ
SµÀ±¹/₄òovµÀ¶çÀ.

1. Om¶²: àaE q₃ emisû¹Sµ ±µvµ±ÀÀhµ ¶¶ç±µÀ?

()

I. ¶²: Àç, t. m, γµ0 OmÀ°, ä±, ¶çÀ »². D¶çhµi

«ò¶çÀ¶²Àolµ±µ0

2. ÈçdS, fµÀ - ±, solµÀ q₃ emisû¹Sµ ±µvµ±ÀÀhµ ¶¶ç±µÀ?

()

I. lÈ¶çÀv¶pwò Èç00µd OmÀ¶²: ä*¹»²àò t. m, γµ0 OmÀ°, ä±, ¶çÀ

»². ¶²: Àç,

3. Dl¹/₄om¶çÀvÀ çn ¶¶ç±¹/₄n ç0d¹±µÀ?

()

I. sñm, kµÀfµÀ, ¶m¶mè±ÀµÀi, Γ ó¶pñSµfu t. iomö¶m,

¶m¶mè±ÀµÀi, ¶²: Àç,

»². ¶m¶mè±ÀµÀi, iomö¶m, Γ ó¶pñSµfu

4. Omµ, i¶²: Àvöo m, d0, né ±µwovov¹/₄ ¶¶ç±µÀ?

()

I. $S\mu\dot{A}\pm\mu\gamma'f\mu Cq_3 \hat{e}\pm, \Pi\phi\dot{A}$ t. $\gamma'\Pi''\dot{A}\phi,$ »².
 $0\mu 0l\mu\dot{A}0\mu\dot{A}\pm 1/4 \alpha\pm \hat{E}\Pi\gamma'w0S\mu 0$

5. $\Pi\phi\dot{A}l\mu i q_3, \Pi m 0, \Pi\phi\dot{A}0\ll, \circ\pm\mu 0, \gamma/4^2\dot{a}0 \Pi^2 0s0l\dot{u}\mu 0 \gamma\tilde{N}w0^2 q\dot{0}\Pi m n$
 $\Pi\phi\dot{A}\dot{A}f\mu\dot{A}$ ()
 $\Pi p\tilde{n}\Pi\phi\dot{A}q, v\dot{A} v\dot{E}\gg^2 0l' 1/4 I\Pi\phi\pm\mu\dot{A}?$
 I. $\hat{E}m\Pi-\dot{A}\tilde{n}$ t. $S, 0l\dot{u}z'a$ »². $\Pi^2\dot{A}s\dot{u}'\dots v\mu 0l\mu\tilde{n}s\tilde{N}'^2$

II. $F 0^2\tilde{n}0l' 1/4 \phi, d^2 0^2 C\pm, \varkappa v\Pi m\dot{A} \phi, \tilde{n}\pm\dot{A}\mu\dot{A}0f^2$

6. $v'\Pi\phi\dot{A}$
7. $\gamma\tilde{n}E\dot{A}0\mu\dot{A}f\mu\dot{A}$
8. $\Pi\gamma\dot{A}\Pi m i\Pi\phi\dot{A}\dot{A}$
9. $\hat{E}\phi\Pi^2 E$
10. $|\pm\mu\Pi^2\dot{A}\dot{u}$

III. $F 0^2\tilde{n}0l' 1/4 \phi, d^2 0^2 \Pi\phi i i\pm\hat{E}0, \pm, \varkappa n\acute{e} \phi, \tilde{n}\pm\dot{A}\mu\dot{A}0f^2$

11. $l\mu\dot{A}\pm\mu\Pi\phi\dot{A}\dot{A}$
12. $m, i\pm\dot{A}\mu\dot{A}\Pi\phi\dot{A}\dot{A}$
13. $n\gamma\Pi\phi\dot{A}\dot{A}$
14. $C\Pi\phi\Pi^2\pm\mu 0$
15. $l\dot{u}\mu\pm\mu\hat{i}0$

IV. $F 0^2\tilde{n}0l' 1/4 \phi, d^2 0^2 m, m, \pm, \varkappa v\dot{A} \phi, \tilde{n}\pm\dot{A}\mu\dot{A}0f^2$

16. $s\Pi^2$

17. νμΑομῶ

V.F 0²ñ01^{1/4} φ, d²0² π²01ûμΑνΑ Εfulέ»² φ, ñ±ΑμΑΑπφΑΑ

18. πp±μπφΑπmΑπφΑ

19. Επφῶε1, ïv±ΑμΑο

VI.F 0²ñ01^{1/4} φ, d²0² π²πφΑπ²0 φ, ñ±ΑμΑοf²

20. sù¹±μi, sùμ±μâvΑ

21. Èp0μΑῶ πφΑqνΑ

VII.F 0²ñ01^{1/4} φ, d²n γhμπp±μΑνμΑπφΑΑ

22. d0SμAdÃ±^{1/4} πpñ0, πφ0

- »p.d². gπ¹

23. πφΑlμ±³ κç±^{1/4}«, ï

- Ε0γ0±μΑ

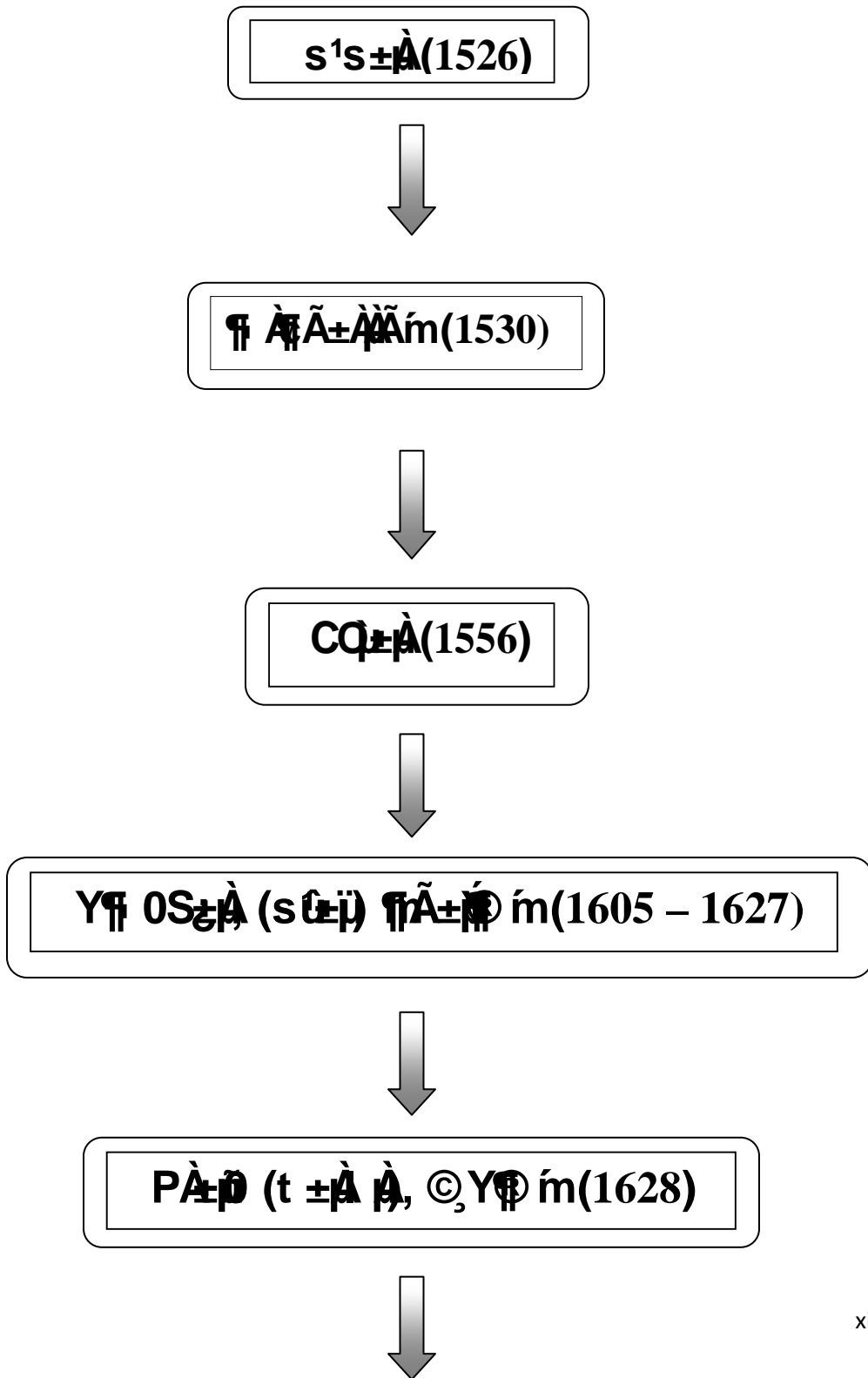
24. πp±μΑSμΑν ±, q²

- D0lûμñ 0Éπ²±^{1/4}

25. ÈφÃ⁰μSμΑofμ0 ΕÈφῶπφῶ±μ±ΑμΑi

- πφΑhμΑπφΑÃ±^{1/4}â

Εφαρμοσμένη Γραμμική Άλγεβρα



N ± ρSμΥΈÀ(1658)

ΈφΑΑΣμν' ± ΑΑν ±, 0μ

(sû' ± μhμlÉπ'0vÑ ΈφΑΑΣμν' ± ΑΑν πp ± 1/4q, vπm)

s's ± μÀ (1526-1530)

- ΈφΑΑΣμν'Αν'Α C0qÉ C0μ πφ0π'πφΑÀ (C0É 0μΑqΑ0s'no² vç0l'±πmφ, ±μÀ).
- ΈφΑΑΣμν'Αν'Α πφΑlûmi D» ± ΑμÀ q, ñ0h, no² vç0l'±πmφ, ±μÀ.
- ΈφΑΑΣμν' ± ΑΑνvÑ πφΑπm lÉ'no² πφwûπm ΈφΑΑqà ΈφΑΑlμq² φ, ±μÀ s's ± μÀ.



- 1526πφ π²0πφhμi ± μ0vÑ s's ± μÀ, Esñ³/4 - 0 vÑf²n q, nπpδΑà (C0μ πpñlÉπ'0) lμSμ0 ± μ ± ΑμÀΑlûmè0vÑ Mf²0w fû²xôn DouñΕΑ0v, fμÀ («i0hμ0 vÉπ²Α0μAm, éfμÀ). Linn ΈφΑΑlμq² q, nπpδΑà ± ΑμÀΑlûmèπφΑÀ C0q' ± μÀ.

ππφ ± μÀ	J π²0πφhμi ± μ0	ππφ ± 1/4n Mf²0v, ± μÀ	IOmôfu (πpñlÉπ'πφΑÀ)
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s's ± μĀ	1526	Esñ ^z / ₄ - 0vñ ^{fe}	q _z n p d Ā à
	1527	±, y p Ā h μ Ā ñ v π φ 0 π ≠ π φ Ā Ā π m 0 μ Ā V Ç 0 I' / 4 π m φ, ± μ Ā	0, q, ö
	1529	D π p ū ù π m Ā v π φ 0 π ≠ π φ Ā Ā π m Ā	S D S, ñ

- 1530vñ s's ± μĀ π φ Ā ± μ q^o 0V, f μ Ā.

π - Ā π φ Ā ± Ā μ Ā Ā' m (1530 - 1556)

- s's ± μĀ 0 μ Ā π φ Ā ± μ Ā f μ Ā π - Ā π φ Ā ± Ā μ Ā Ā' m.
- 1530vñ » 0 π π Ā m, n o^e (C l ū' / 0, ± μ π φ Ā Ā v ñ 0^e) π φ v, ū f μ Ā.



- 1540vñ Ē'' ±^z, C Ē m ±, y Ā π - Ā π φ Ā ± Ā μ Ā Ā' m π m Ā 0 μ m D y^z (C 0 μ π p ū Ē Ē π ≠ 0)
l u S μ 0 ± μ ± Ā μ Ā Ā l ū m è 0 v ñ M f^o 0 V Ç π m Ā.

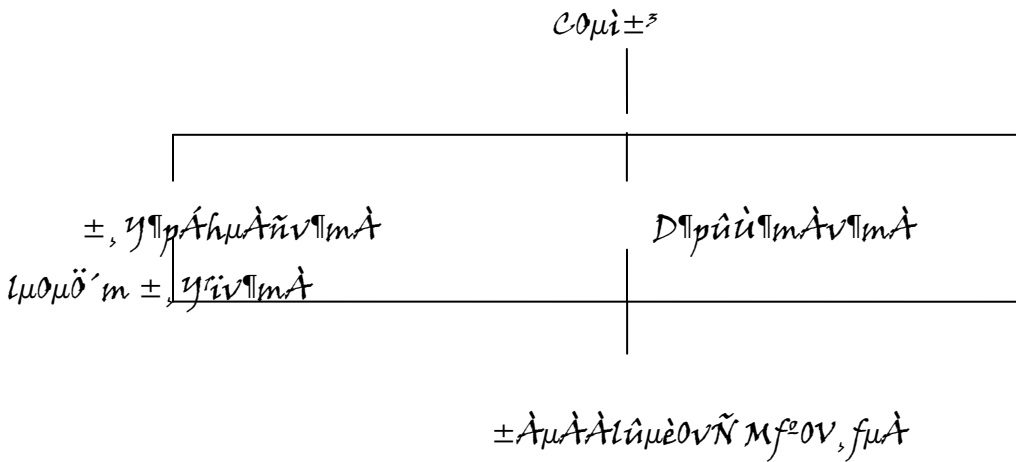
- 1555vñ Πρ±ι/ϕ±ÀμÃ ÎÉΠκΠρÁ ±, γÃ Π±Π°±ÀμÀοηÐ fû°xôn **ΔομνῆΕΑΟΝ, fuÀ**
(«iòhμo vÉΠ°ΑομΑm, éfuÀ).
- Π-ÀΠφÃ±ÀμÃ' m ΣÍΠê Πρ°ημÁfuÀ - ομΠφÁvΠmÁ, Πρ°ημÁvΠmÁ,
κΠ°áòγ.ÁsvΠmÁ qò»·ov, fuÀ.
- 1556vñ Π-ÀΠφÃ±ÀμÃ' m ΠφÁ±μq°ov, fuÀ.

σομ±μÁ (1556 – 1605)

- Π-ÀΠφÃ±ÀμÃ' m ομÁΠφÃ±μÁfuÀ σομ±μÁ.



- 1556v^N ¶⁰±μ°μομα̂^α (hμof²ñ vοd² ¶φiο²ā) C±ÀÀ¶m Ęsûç±, 0P' m Cομi±³¶mÀ vμομñ¶φ±¹/4ā (±, ±, γAS,) ¶pñομd²0V, fuÀ.
- 1556v^N Ę-¶φÀÀομα̂ Cομi±³ομα̂ q₃ n¶p d'Àā (Cομ ¶pñiĚ¶φ) ¶φlμç ±ÀμÀÀlûμè0 γ±¹/4S¹/40l¹/4. Lenn ±ç0fμ¶φ q₃ n¶p d'Àā ±ÀμÀÀlûμè0 Cn C0d¹±μÀ.



- ±, γ¶pÀhμÀñvÀ hμ¶φÀ ομα̂¶φÀ±çāv¶mÀ Cομi±³ομα̂ Ęwû Ęφ, ¶-0 VĚ¹±μÀ.
- Cομi±³ ¶pñγvομα̂ g¶p±ÀçĀSμ¶p fĚ ¶p±¹/4q₃ vm, ¶plμèhμÀv¶mÀ ¶pñĚφ¶Ěp d'ā fuÀ.
- hμ¶m «, ¶φĀñγriné (±, γriné) CĚmομ '¶²Ās' (w¶mè w¶mè q₃ ñoh, vAS,) ĘsûμZ0V, fuÀ.
- Ę±çh, ö±ç (Ę±çhμÀvομα̂ g¶p±ÀçĀSμ¶p fĚ) ¶plμèhμÀv¶mÀ ¶pñĚφ¶Ěp d'ā fuÀ.
- sûmĀĘAn ¶²±Ěö (oívw) VĚ±ÀÀ0w ¶p d'āvÀ (¶-ομα̂ō¶mÀ) ĘV, ûfuÀ. ¶p d'v^N 1/3¶φοhμÀ ¶p¶mÀé ¶φ¶²ĀvÀ (g¶²Αοí¶mÀd) VĚ¹fuÀ.

- $\ddot{E}\ddot{E}^a n o m E l \hat{u}$, $\mathbb{1} m o v \tilde{N} \mathbb{1} \phi \hat{A} \mathbb{1} m \hat{u} s^z l$, $\pm 1/4$ ($\ddot{E}\ddot{E}^a m$, $i n o^e \dot{E} p l u \phi \mathbb{1} \phi i o^e \hat{a}$) $\mathbb{1} p l u \hat{e} i n$
 $\mathbb{1} p \tilde{n} \dot{E} \phi \mathbb{1} \times \dot{E} p d^i \hat{a} f u \hat{A}$.
- $\mathbb{1} p \tilde{n} i$ $\mathcal{L} o m \hat{o} \mathbb{1} \phi \hat{A} \mathbb{1} m \hat{u} s^z l$, $\pm 1/4 o^e$ 10,000 $\dot{E} \phi v \mathbb{1} \phi \hat{A} o l^1/4$ $\ddot{E}\ddot{E}^a m$, $i n \acute{e} E v$, $\hat{u} f u \hat{A}$.
- m , $i \pm \hat{A} m \hat{A} E v$, $\pm \mu g v \tilde{N} \dot{E} \phi \hat{A} \hat{A} s u v^i \pm \hat{A} \hat{A} c o m i \pm^z$ $v m o m \tilde{n} \mathbb{1} \phi \pm \dot{E} \hat{a}$ (\pm , \pm , $\gamma \hat{A}$)
 $h u \hat{A} l^1/4$ $n \pm \mu \hat{a} \pm \hat{A} m \hat{A} l \hat{u}^1/4 o$, $\pm 1/4$. $\mathbb{1} p \tilde{n} i \mathbb{1} \times \hat{A} o m \tilde{n} \phi$, $\pm \mu o \mathbb{1}^a s \hat{u} m v \tilde{N} m$, $i \pm \hat{A} m \hat{A}$
 $n \pm \mu \hat{a} \pm \hat{A} m \hat{A} o v \dot{E} \pm \hat{A} m \hat{A} s f \dot{E} l^1/4$.
- $\gg - o l m \hat{A} \mathbb{1} \phi \hat{A} v o \dot{E} \mathbb{1}^a \hat{A} v \mathbb{1} m \hat{A}$ ($\mathbb{1}^a \mathbb{1} \phi \hat{A} \mathbb{1}^a i v \mathbb{1} m \hat{A}$) $E v$, $\pm 1/4 o v m f$, $n o^e$
 $\mathbb{1} p o f^e h u \hat{A} v \mathbb{1} m \hat{A} n \pm \hat{A} m \hat{A} E \hat{A} o v$, $f u \hat{A}$.
- $c o m i \pm^z \mathbb{1} \phi \hat{A} h u E \mathbb{1}^i \pm \hat{A} m \hat{A} o v \tilde{N} \gg - o l m \hat{A} \mathbb{1} \phi \hat{A} v \mathbb{1} m \hat{A} \mathbb{1}^a \mathbb{1} \phi \hat{A} \mathbb{1} m o s$,
 $v m \hat{A} \dot{E}^a \mathbb{1} m \hat{A}$.
- $\mathbb{1}^a i \mathbb{1} \phi o d^e$, $l m \hat{A} \pm$, v , \pm , $v \mathbb{1} m \hat{A} \mathbb{1} \phi \hat{A} n \acute{e} o v m f$, $n o^e$ $\mathbb{1} p \tilde{n} \pm \hat{A} m \hat{A} h u \acute{e} o v \dot{E} \times f u \hat{A}$.
- $\gg - o l m \hat{A} \mathbb{1} \phi \hat{A} v \mathbb{1} m \hat{A} o f^e \mathbb{1} \phi \mathbb{1}^a \hat{A} v \hat{A} v \dot{E} \dot{E}^a z z \pm \hat{A} m \hat{A}$ ($\gamma \hat{A} d \hat{A} \hat{a} \alpha \hat{A} l$,) $\mathbb{1} p \mathbb{1} m \hat{A} \acute{e}$,
 $j \pm \mu \acute{e} \pm \hat{A} m \hat{A} h u \tilde{n}$ ($l \dot{E} \phi$, $v \pm \hat{A} m \hat{A} v \mathbb{1} m \hat{A} l m \pm 1/4 \div o v m \hat{A} d o m \hat{A}$) $\mathbb{1} p \mathbb{1} m \hat{A} \acute{e}$
 $\pm \mu l m \hat{A} \phi v \dot{E} \times f u \hat{A}$.
- 1575 $v \tilde{N}$ “ $E s l u h^z P^i m$,” $c \hat{E} m q_3$ $\tilde{n} \pm \mu \acute{e} m$, $\mathbb{1} \phi \hat{A} o l^1/4 \pm$, $n \acute{e} n \pm 1/4 i o v$, $f u \hat{A}$.
- 1582 $v \tilde{N}$ “ $l^1/4 m - E - E v$ » -” $c \hat{E} m o \hat{i} \tilde{n} h u \hat{a} \mathbb{1} \phi \hat{A} h$, $n \acute{e} \ll, \gg p o v$, $f u \hat{A}$.
- “ $l^1/4 m - E - E v$ » -” $\mathbb{1} \phi \hat{A} h u \mathbb{1} \phi \hat{A} \hat{A} v \tilde{N} \gg - o l m \hat{A} \mathbb{1} \phi \hat{A} \dot{E} f \phi \mathbb{1} m \pm$, $\gamma^i u \pm^z s v^z$
 $\mathbb{1} \phi \hat{A} h u \tilde{n} \dot{E} \phi \hat{A} v \dot{E} \pm$, $f u \hat{A}$.
- $c o m i \pm^z D \ll, \gg \mathbb{1} m \mathbb{1} \phi \hat{A} \hat{A} v \tilde{N}$ (\pm , $\gamma s \hat{u} m \mathbb{1} \phi \mathbb{1} m \mathbb{1} \phi \hat{A} \hat{A}$) “ h , $^i m \dot{E}^a m$ ” $c \hat{E} m$
 $s \hat{i} \mathbb{1} p \acute{e} \mathbb{1}^a o s \acute{e} h u E l$, $\ddot{o} \mathbb{1}^a \hat{A} f u \hat{A}$ ($\mathbb{1} p o f^e h u \hat{A} f u \hat{A}$) $g o f \dot{E} \phi$, $f u \hat{A}$.
- $c o m i \pm^z \mathbb{1} p \pm 1/4 q_3 v m$, o , $v \mathbb{1} \phi \hat{A} \hat{A} v \tilde{N} l \dot{E} \mathbb{1}^i \times o$ « $\ddot{o} s \hat{u}^i s \mu i \mathbb{1} \phi \hat{A} \hat{A} s$, ($\dot{E} \dot{E} p \pm \mu \hat{A}$
 $\mathbb{1} p v m \hat{u} v h \hat{D}$) $g o f \phi \mathbb{1} m \hat{A}$.
- 1605 $v \tilde{N}$ $c o m i \pm^z \mathbb{1} \phi \hat{A} \pm \mu g^e o v$, $f u \hat{A}$.

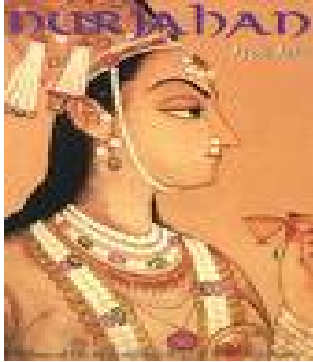
Ἰἰ-05ἰ±ἰ (1605 – 1627)

➤ $\text{C}\mu\text{i}\pm^{\text{z}}\text{O}\mu\text{A}\text{I}\phi\text{A}\pm\mu\text{A}\text{f}\mu\text{A}\text{I}\text{I}\text{-05ἰ}\pm^{\text{z}}$.



➤ » $\text{O}\mu\text{A}\ddot{\text{O}}\nu\text{I}\phi\text{A}\text{h}\mu\text{S}\mu\text{A}\pm\mu\text{A}\text{I}\phi\text{A}\text{C}\pm\text{A}\text{A}\text{I}\text{m}\text{C}\pm\mu\text{A}\text{y}'\text{m}$ » $\text{O5}^{\text{z}}\text{I}\text{m}\text{A}$
 $\text{v}\mu\text{O}\text{»}\rho\text{O}\text{V}$, $\text{f}\mu\text{A}$. $\text{C}\text{O}\text{I}\mu\text{A}\text{I}\phi\text{v}\delta\text{I}\rho\text{o}\gamma\text{'s}\text{A}\nu\tilde{\text{N}}\text{n}$ » $\text{O}\mu\text{A}\ddot{\text{O}}\nu\text{O}\mu\text{A}$
 $\text{I}\phi\text{A}\pm^{1/4}\pm\text{A}\mu\text{A}\text{A}\text{E}\phi\text{A}\text{A}\text{S}\mu\text{v}\nu\text{O}\mu\text{A}$ **Ἰἰἰ±μῶ (E±Dlûμῶ)** $\text{J}\pm\mu\hat{\text{e}}\text{f}^{\text{O}}\text{O}\text{l}'/4$.

- $\gamma\eta\text{-}\sigma\zeta\pm\mu\acute{\alpha}\ \sigma\acute{\alpha}\tilde{\nu}\tilde{\sigma}\mu\tilde{\nu}\nu\eta\acute{\alpha}\mu\acute{\alpha}\ (\text{?}/\text{?}\ \acute{\alpha}\delta\tilde{\nu}\tilde{\nu}\acute{\alpha}\mu\acute{\alpha}),\ h,\ \tilde{\nu}\sigma\mu\acute{\alpha}\tilde{\nu}\tilde{\eta}\mu\acute{\alpha},$
 $\sigma\omicron\lambda\mu\acute{\alpha}\eta\phi\tilde{\nu}\tilde{\sigma}\ \pm,\ \gamma\eta\ \eta\mu\pm\text{?}/\text{?}\ \text{?},\ \nu\eta\mu\eta\mu\acute{\alpha},\ \sigma\eta\mu\tilde{\nu}\tilde{\sigma}\tilde{\mu}\tilde{\iota}\ \sigma\pm\acute{\alpha}\acute{\alpha}\eta\mu$
 $\eta\mu\acute{\alpha}\pm\mu\acute{\gamma}\eta\text{?}\ m\ \nu\acute{\epsilon}\tilde{\iota}\nu\tilde{\nu}\ \acute{\epsilon}\rho\acute{\alpha}\acute{\alpha}\mu\acute{\alpha}.$



- $\eta\mu\acute{\alpha}\pm\mu\acute{\gamma}\eta\text{?}\ m\ \nu,\ \nu\ \eta\eta\phi\acute{\alpha}\pm\mu\acute{\alpha}\tilde{\epsilon}\pm,\ \nu\acute{\alpha}.$
- $i\pm\mu\acute{\alpha}\sigma\mu\acute{\alpha}\tilde{\sigma}\acute{\alpha}\eta\mu\acute{\alpha}\ (\pm\acute{\alpha}\mu\acute{\alpha}\acute{\alpha}\tilde{\iota},\ \tilde{\epsilon}\nu\eta\mu\acute{\alpha})\ \sigma\eta\tilde{\sigma}\omega\ \pm,\ \gamma\tilde{\iota}\tilde{\nu}\tilde{\epsilon}\ \sigma,\ \eta\tilde{\sigma}\ \text{?}\ \text{?}/\text{?}.$
 $\acute{\epsilon}\phi\acute{\alpha}\phi,\ \text{?}$
 $\mu\eta\eta\mu\acute{\alpha}\tilde{\sigma}\ \text{?}\ \text{?}\ \sigma\tilde{\alpha}\tilde{\sigma}\ \pm,\ \gamma\tilde{\iota}\nu\acute{\alpha}\ \sigma\mu\eta\tilde{\rho}\tilde{\epsilon}\ (\eta\eta\mu\acute{\alpha}\tilde{\epsilon}\nu\acute{\alpha})\ \nu\zeta\omega\delta\sigma\tilde{\nu}\mu\tilde{\phi},\ \eta\sigma\tilde{\epsilon}$
 $\sigma\omicron\sigma\zeta\omicron\mu\pm\text{?}/\text{?}\ \nu,\ \pm\acute{\alpha}\acute{\alpha}.$
 $\sigma\delta\nu\tilde{\iota}\tilde{\sigma}\tilde{\sigma}\mu$
- $\gamma\eta\text{-}\sigma\zeta\pm\sigma\mu\acute{\alpha}\eta\phi\acute{\alpha}\pm\mu\acute{\alpha}\tilde{\epsilon}\tilde{\zeta}\eta\mu\ \rho\acute{\alpha}\pm\mu\tilde{\eta}\tilde{\sigma}\ (\text{?},\ \gamma\eta\text{?}\ m)\ \eta\mu\acute{\alpha}\pm\mu\acute{\gamma}\eta\text{?}\ m$
 $\epsilon\eta\pm\acute{\alpha}\mu\acute{\alpha}\nu\sigma\mu\acute{\alpha}\ \sigma,\ \pm\mu\eta\sigma.$

$\rho\acute{\alpha}\pm\mu\tilde{\eta}\tilde{\sigma}\ (\text{?},\ \gamma\eta\text{?}\ \eta\mu\acute{\alpha})\ (1628 - 1658)$

- $\gamma\eta\text{-}\sigma\zeta\pm\sigma\mu\acute{\alpha}\eta\phi\acute{\alpha}\pm\mu\acute{\alpha}\tilde{\epsilon}\mu\acute{\alpha}\text{?},\ \gamma\eta\text{?}\ m\ (\rho\acute{\alpha}\pm\mu\tilde{\eta}\tilde{\sigma}).$



- $\text{P}\hat{\text{A}}\pm\mu\tilde{\text{n}}\text{O}^\circ$, $\text{Y}\Pi^\circ$ 'm $\text{C}\hat{\text{E}}\text{m}$ $\text{t}\pm\mu\hat{\text{A}}\mu\hat{\text{A}}\text{h}\text{D}$ 1628v $\tilde{\text{N}}$ » $\text{E}\text{O}\Pi^\circ\text{q}\text{A}\hat{\text{A}}\Pi\text{m}\text{O}\hat{\text{A}}$
 $(\text{C}\hat{\text{I}}\hat{\text{u}}/\text{+}\text{O}, \pm\mu\Pi\hat{\text{A}}\hat{\text{A}}\Pi\text{m}\text{O}\hat{\text{A}})$ $\Pi\hat{\text{C}}\text{V}$, $\hat{\text{u}}\text{f}\mu\hat{\text{A}}$.
- $\text{G}\text{h}\mu\hat{\text{a}}\pm\mu\text{s}\hat{\text{u}}'\pm\mu\text{h}\mu$ $\text{I}\hat{\text{E}}\Pi\hat{\text{K}}\text{O}$, $\text{I}\mu\text{O}\mu\hat{\text{o}}'$ m \pm , $\text{Y}\hat{\text{i}}\text{v}\hat{\text{A}}$ $\text{E}\text{h}\mu\text{n}$ $\text{D}\hat{\text{I}}\hat{\text{u}}\hat{\text{I}}\Pi\text{m}\Pi\hat{\text{C}}\hat{\text{A}}\hat{\text{A}}\text{v}\tilde{\text{N}}\text{O}^\circ$
 $(\Pi\text{p}\pm'/\text{+}\text{q}_3 \text{v}\Pi\text{m}\text{v}\tilde{\text{N}}\text{O}^\circ)$ $\Pi\hat{\text{C}}\text{V}$, $\hat{\text{u}}\pm\hat{\text{A}}\hat{\text{A}}$.
- $^\circ$, $\text{Y}\Pi^\circ$ 'm $\Pi\text{p}\pm'/\text{+}\text{q}_3 \text{v}\Pi\text{m}\text{O}$, $\text{v}\text{O}\text{v}\tilde{\text{N}}$ $\text{C}\hat{\text{E}}\text{m}\text{O}\mu$ $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}\text{v}\hat{\text{A}}$
 $\hat{\text{E}}\text{m}\text{v}\text{O}\hat{\text{I}}\text{v}\hat{\text{e}}\text{s}\text{f}$, $\hat{\text{a}}\pm\hat{\text{A}}\hat{\text{A}}$. $\Pi\text{p}\text{O}\text{V}\mu\text{I}$, $\pm\mu$ $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}$, $\text{E}\Pi\text{m}\hat{\text{A}}\Pi\hat{\text{C}}\hat{\text{A}}\hat{\text{A}}$, $\text{G}\text{O}\mu\hat{\text{A}}\text{O}$
 $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}$, mOO , $\text{n}\pm$, $\hat{\text{i}}\text{q}\Pi\hat{\text{C}}\hat{\text{A}}\hat{\text{A}}$, \pm , $\text{S}'/\text{+}$ $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}$, $\text{E}\text{h}\mu\hat{\text{a}}\text{f}^\circ$
 $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}$, $\Pi\hat{\text{C}}\Pi^\circ\hat{\text{a}}\text{O}$ $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}$, $\hat{\text{E}}\hat{\text{C}}\hat{\text{A}}\hat{\text{A}}\mu\hat{\text{E}}\text{v}\hat{\text{C}}\Pi\text{m}$
 $\Pi\text{p}\pm'/\text{+}\Pi\hat{\text{K}}\hat{\text{u}}\Pi\hat{\text{C}}\hat{\text{A}}\text{v}\hat{\text{A}}$ « æ » $\text{p}\text{O}\text{V}\mu\text{s}\text{f}$, $\hat{\text{a}}\pm\hat{\text{A}}\hat{\text{A}}$. $\text{E}\text{h}\mu\pm\mu$ $\Pi\hat{\text{C}}\Pi^\circ\hat{\text{A}}\hat{\text{a}}\Pi\hat{\text{C}}\hat{\text{A}}\text{v}\Pi\text{m}\hat{\text{A}}$
 $\text{E}\text{I}\hat{\text{E}}\hat{\text{K}}\text{v}\text{O}\mu\hat{\text{A}}$ $\text{I}\text{S}\mu\hat{\text{A}}\Pi\hat{\text{C}}\hat{\text{A}}\text{i}$ $\text{V}\hat{\text{E}}\hat{\text{E}}^\circ\hat{\text{C}}$, $\text{f}\mu\hat{\text{A}}$.
- $\Pi\text{p}\hat{\text{u}}\Pi\text{p}\text{O}\text{V}\mu$ $\Pi\text{p}\hat{\text{u}}\text{»}^\circ\text{I}'/\text{+}\text{e}\text{S}$, $\text{O}\text{W}\Pi\text{m}$ ($\hat{\text{E}}\text{p}\pm\mu\hat{\text{A}}\text{q}\hat{\text{I}}\text{O}\text{I}'/\text{+}\Pi\text{m}$) h , $\text{Y}\hat{\text{z}}\Pi\hat{\text{C}}\hat{\text{A}}\Pi-\text{v}^\circ$
 $\text{n}\pm'/\text{+}\hat{\text{i}}\text{O}\text{V}$, $\text{f}\mu\hat{\text{A}}$.



- $\Gamma\text{O}\text{D}\hat{\text{d}}$, $\text{Y}\hat{\text{A}}\Pi\hat{\text{C}}\hat{\text{A}}\Pi\hat{\text{C}}\hat{\text{A}}^\circ/\text{+}\hat{\text{A}}\mu\hat{\text{A}}$, $\hat{\text{E}}\hat{\text{E}}\hat{\text{C}}\hat{\text{A}}\text{i}\Pi\hat{\text{C}}\hat{\text{A}}^\circ/\text{+}\hat{\text{A}}\mu\hat{\text{A}}$ $\text{E}\text{h}\mu\text{n}$ O , $\text{v}\text{O}\text{v}\tilde{\text{N}}$
 $\Pi\text{p}\hat{\text{u}}\text{»}^\circ\text{I}'/\text{+}\text{e}\text{V}\hat{\text{C}}\text{O}\text{I}'/\text{+}\Pi\text{m}$ ($\hat{\text{E}}\text{p}\pm\mu\hat{\text{A}}\text{q}\hat{\text{I}}\text{O}\text{I}'/\text{+}\Pi\text{m}$) $\text{O}\mu\hat{\text{d}}\hat{\text{a}}\text{f}$, $\text{v}\hat{\text{A}}$.

- °, $\gamma \pi^{\circ} \pi m \dot{A} \pi p \pm 1/q, v m, 0, v' n \acute{e} \pi^{\circ} \pm \mu \ddot{a} \pm \dot{A} \mu \dot{A} \dot{A} S \mu 0$ (sOS, $\pm \mu \dot{A}$ ($\pi \phi \dot{A} 0 \omega$) $\pi p \pm 1/q, v \pi m 0, v \pi \phi \dot{A} \dot{A}$) $C 0 d' \pm \mu \dot{A}$.
- 1658 $v \tilde{N}^{\circ}$, $\gamma \pi^{\circ} \pi m \dot{A} \pi \phi \dot{A} \pm \mu g^2 0 V$, $f \mu \dot{A}$.

$N \pm \mu 0 S \mu \gamma \acute{E} s \dot{A}$ (1658 – 1707)

- °, $\gamma \pi^{\circ} m \pi \phi \dot{A} \dot{A} f \mu \pi \phi 0 \mu \dot{A} \pi \phi \dot{A} \pm \mu \dot{A} f \mu \dot{A} N \pm \mu 0 S \mu \gamma \acute{E} s \dot{A}$.



- 1658 $v \tilde{N}^{\circ}$ » $^{\circ} 0 \pi^{\circ} \pi^{\circ} \pi m \pi \phi \dot{A} \dot{A} \pi m \dot{A} C \dot{L} \dot{u} 1/4$ » $\dot{\alpha} 0 V$, $f \mu \dot{A}$ ($C \dot{L} \dot{u} 1/4 0$, $\pm \mu \pi \phi \dot{A} \dot{A} \pi m \dot{A}$ « $\dot{I} 0 h \mu 0 V \acute{E} \pi^{\circ} \dot{A} 0 \mu \dot{A} m$, $\acute{e} f \mu \dot{A}$).
- $N \pm \mu 0 S \mu \gamma \acute{E} s \dot{A} E \ll$, $\delta \pi \phi \dot{A} \dot{A} v \tilde{N}^{\circ}$ « $\pi^{\circ} \dot{A} 0 \acute{e}$ » $\gamma i 0^2 V \zeta 0 1/4 \pi m \phi$, $f \mu \dot{A}$.
- $E \ll$, $\delta 0 \pi \phi \dot{A} h$, $t \dot{u} \pi \phi \dot{A} n$ ($\pi \phi \dot{A} h \mu 0 \ddot{E} \ddot{E} p E \pi p \pm \dot{e} h \mu \ddot{E} \dot{E} \phi \dot{A} \pi m E \pi^{\circ} \dot{\alpha} 0 \mu w S 1/4$ $g o f \mu \dot{A} 0$).
- » $^{\circ} 0 \mu \dot{A} \ddot{O} v \pi \phi \dot{A} h \mu S \mu \dot{A} \pm \mu \dot{A} \pi \phi \dot{A} C \pm \dot{A} \dot{A} \pi m h \acute{E} \gamma^3 s \pi - \dot{A} \dot{L} \mu \dot{A} \pm^{\circ} \pi m \dot{A}$ $v \mu 0$ » $p 0 V$, $f \mu \dot{A}$. $C 0 \dot{L} \mu \dot{A} \pi \phi v \pi m$ » $^{\circ} 0 \mu \dot{A} \ddot{O} v h \mathcal{D} \ddot{E} \dot{E} \phi \pm \mu 0$ ($E \pm \mathcal{D} \dot{L} \dot{u} \mu 0$) $J \pm \mu \acute{e} f^{\circ} 0 1/4$.

- $N \pm \mu O S \mu Y \acute{E} s \acute{A} \ll \text{ϠϠ\tilde{\eta}\eta\iota\omicron} (\pm, \eta\iota\text{Ϡ}\acute{A}\acute{A}) \circ, \text{S}\acute{i} \pm \mu \acute{A} \text{Ϡ}\text{m}\acute{A}\text{of}^{\circ} \circ, \acute{E}\phi \pm 1/4$
 $\text{Ϡ}\phi \pm \mu \text{O} \mu \acute{A}, \circ, \text{s}\acute{A} \nu^{\circ} \text{Ϡ}\text{m}\acute{A}\text{of}^{\circ} \text{w}\acute{d}\acute{a}\text{S}, \text{O}\text{S}^{\circ} \text{Ϡ}\phi \pm \mu \text{O} \mu \acute{A} \phi, \text{i}\gg \text{p}\text{O}\text{W}\text{O}\text{I}^1/4.$
- $N \pm \mu O S \mu Y \acute{E} s \acute{A} \text{Ϡ}\text{p}\tilde{\eta}\eta\upsilon \acute{E}\acute{E}\text{m}\text{i}\text{O}\mu \text{a}\text{Ϡ}\phi\text{m}, \text{n}\acute{e} \text{S}\mu\text{Ϡ}\phi\acute{A}\text{n}\text{O}\nu\mu\phi, \text{n}\text{O}^{\circ}$
 $\ll \text{Ϡ}\phi\acute{A}\acute{A}\text{h}, \phi, \gg \text{E}\text{S}^{\circ} \gg \text{C}\acute{E}\text{m} \text{Ϡ}\phi\acute{A}\text{h}, \text{l}\acute{u}^1/4\text{O}, \pm \mu \acute{A} \nu \text{Ϡ}\text{m}\acute{A} \text{n} \pm \acute{A} \mu \acute{A} \text{E}\acute{A}\text{O}\nu, \text{f}\mu \acute{A}.$
- $N \pm \mu O S \mu Y \acute{E} s \acute{A} 1707 \nu \tilde{\text{N}} \nu \mu \eta \text{q}\text{O} \pm \acute{A} \mu \tilde{\text{A}} \text{f}\mu \acute{A}.$
- $N \pm \mu O S \mu Y \acute{E} s \acute{A} \text{h}\mu \pm \mu \acute{A} \phi, \text{h}\mu \text{Ϡ}\phi \text{w}\acute{u} \text{Ϡ}\text{m} \acute{E}\phi \acute{A}\acute{A} \text{S}\mu \nu \acute{A} \nu \acute{A}$
 $\text{Ϡ}^{\circ} \text{Ϡ}\phi \acute{A} \pm \mu \text{e} \text{Ϡ}\phi \text{O} \text{h}\mu \acute{A} \nu \acute{A} \text{O}, \text{l}\mu \acute{A}.$

!φ, Z (1627 – 1680)

- $N \pm \mu O S \mu Y \acute{E} s \acute{A} \text{Ϡ}\text{p} \pm 1/4 \text{q}, \nu \text{Ϡ}\text{m}\text{O}, \nu \text{Ϡ}\phi \acute{A} \acute{A} \nu \tilde{\text{N}} !\phi, \text{Z} \text{l}\mu \text{O} \mu \acute{O} \text{m} \nu \tilde{\text{N}} \text{O}\acute{\text{I}}\text{O} \text{h}\mu$
 $\text{q}, \tilde{\text{n}}\text{O} \text{h}, \text{n}\acute{e} \text{D}\text{O} \mu \tilde{\text{n}} \text{E}\acute{A}\text{O}\nu \mu \acute{A} \text{O} \mu \acute{A} \text{m}, \acute{e}\text{f}\mu \acute{A}.$
- $! \phi, \text{Z} \acute{E}\phi \acute{A}\acute{A} \text{S}\mu \nu \acute{A} \nu \text{Ϡ}\text{m}\acute{A} \text{I}\text{I}^1/4 \pm 1/4 \text{O}\text{W} \text{h}\mu \text{Ϡ}\text{m} \ll, \text{o}\text{O} \text{h}\mu \text{O} \text{h}, \text{i}\text{O} \text{n}\acute{e}$
 $\text{n}\nu \acute{A} \text{Ϡ}\text{p} \acute{A} \text{O} \mu \acute{A} \text{m}, \acute{e}\text{f}\mu \acute{A}.$
- $! \phi, \text{Z} \text{h}\mu \text{w}\text{O} \text{Z}\eta \text{'s}' \pm \acute{A} \acute{A}, \text{h}\mu \text{O}\text{f}^{\circ} \tilde{\text{n}}^{\circ}, \text{a}\text{s}\tilde{\text{u}} \tilde{\text{N}} \text{O} \acute{E}^{\circ} \hat{\text{o}}.$
- $1627 \nu \tilde{\text{N}} !\phi, \text{Z} \eta \text{n}\acute{\text{i}}\text{O}\nu, \text{f}\mu \acute{A}.$



- 2011 φ Jd²0² SÍ11pê EYÉhu C±ÀμÄifμÄ.
- 1647vÑ CÊm0μ q, ñ0h, v11mÄ D0μñEÁOV, fuÄ. hÐ±μé, 11pÄ±μ0Lûμ±^z, ±, ±Ä^zÄSμf^z, 11^zÄ±μh^z.
(ËËp11m Êp±ÏÖ11mé 11pñlÉ^zv11mÄ sù¹±μhμlÉ11^z 11pá0vÑ vμÄ»pOVμfu0).



- 0ÐdV11mÄ uY11pÄ¹±^z 11^zÄv¹á¹m lμSμ0±μ 11mÄ0f²
VÉZ0²ÖOVμÄ0μÄm, éfuÄ (Clû¹/+0, ±μ11φÄÄ11m0μÄ 11φV, ûfuÄ).
- 1665vÑ ±, Y¹ËYÇ»^z0S^zhÐ 11pÄ±μ0Lûμ±^z 11^z0Lû¹/+ (Ë^zÉ11-0)
VÉ11^zÄ0μÄm, éfuÄ.
- 1666vÑ DS, ñ 0ÐdVÑ N±μ0SμYÉsÄ | φ, Zn solû¹/+0V, fuÄ. hμ»pêOVμÄ0In
ËφÄÄSμvÄv 0ÐdV11mÄ «, öLû^zÉ11m0 («ÏÖhμ0) VÉ11^zÄ0μÄm, éfuÄ.
- 1674vÑ | φ, Z0², **Vûμhμñ11pi CÊm t±μÄlμÄhÐ, ±, ±ÄμÄSμf^zvÑ**
11pá¹ätûË^z0μ0 Y±¹/+S¹/+0L¹/+.
- 11p±¹/+q, v11mvÑ 11^z11^z±ÄμÄ11pfuf, n0² 8 11φÄ0L¹/+11^zsûμÄiv11mÄ 11φÄ0iñ
11p±¹/+11^zhμÄä11mÄ J±μé±μV, fuÄ. ±±¹/+Ëm “C11^zä11pñlû, 11mÄvÄ”
C0d¹±μÄ. 11pñlû, 11m 11φÄ0iñn “^z/+p^z, ö” C0d¹±μÄ.
- | φ, Z hμ11m ±, Y¹iné 11φÄÄfuÄ ±, °, àðvÄS, EsûμZOV, fuÄ. L0ÏÖ0μö
±, °, àðn0² ±, Y¹11pñinlû¹/+n n±ÄμÄEÁOV, fuÄ.
- sûμÄEÄn 0ÍwW 2/3 11φ0hμÄ 11p11mÄévÄ 11φ11^zÄvÄ VÉ^zfuÄ.
- 11φi11φ«, ±ÄμÄl, ±μÄv0μÄ sÄÄq, v11mÄ Ewû 11φi11φ«, ±ÄμÄ
sûμÄ11φÄÄvÄ ÊpOV, fuÄ.

- |φ, Z 1μSμ0 ±μ ΟμñΠφÀ | °μghD ΟμΆf²Πm ĘĘ²Πmi0 GofĘl'⁄₄, m00, 1μγμ0 ΟμΆf, GΠmél'⁄₄.
- |φ, Z Πp ±μΠφÀhμ Π²Π - ΠmΠφÀÀ vμΆ»pOV, fμÀ, PÀ±, 'mΠmÀ S0 ±μEOV, fμÀ. ΠφÀΠ - ΠφÀilz ±ÀμÀ ²⁄₄² àovÀ, »pvòvÀ, ĘĘ²m, ino² w0²öhĘ φ, ±¹⁄₄n **D1μ ±μΠφÀhD (S0 ±μΠφ0hD)** i ±¹⁄₄S¹⁄₄ Πp0Ępφ, fμÀ.
- |φ, Z ΠφÀΠ° ±, Π· àò n ±, ihμS, vμ ±¹⁄₄hμñvñ **ε!Π·à (S1Πpè)** «, æm, né DομñΕΑOV, fμÀ.
- |φ, Z 1680vñ ΠφÀ ±μg²OV, fμÀ.

DAILY TESTS

ἡμέρα-1 (TEST-1)

$E_L, i^{\pm 1/4} \hat{E} p^{\pm \mu \hat{A}}$:

$h \hat{E} L^{1/4}$:

$h \mu^{\pm} \mu S \mu i$:

$q_s e \mu^{\pm} v \hat{E} p^{\pm \mu \hat{A}}$:

$\hat{E} \phi \hat{A} \hat{A} h \mu \hat{a} 0$

$\mathbb{1} \phi \hat{A}^{\pm} \mu \hat{A} \hat{O} v \hat{A} : 5$

$F 0^2 \tilde{n} 0 L^{1/4} P i v \mathbb{1} m \hat{A} \mathbb{1} p \hat{A}^{\pm 1/4} 0 \mathbb{1} p \hat{A} \mathbb{1} \phi \hat{A} \hat{A}$.

1. $\hat{E} \phi \hat{A} \hat{A} S \mu v v \hat{A} C 0 d \hat{E} L 0 \mu \dots \dots \dots$
2. $\hat{E} \phi \hat{A} \hat{A} S \mu v v \hat{A} q_s v \mathbb{1} m s \hat{u}^{\pm} \mu h \mu l \hat{E} \mathbb{1} \neq 0 v \tilde{N} \dots \dots \dots$
 $\pm, \eta \hat{A} h \mathbb{D} q_s \tilde{n} \pm \mu 0 s \hat{u} \mu \hat{E} \hat{E} \phi \hat{A} 0 L^{1/4}$.
3. $\hat{E} \phi \hat{A} \hat{A} S \mu v v \hat{A} J q_s \tilde{n} 0 h, n 0^2$
 $v \phi 0 L^{1/4} \mathbb{1} m \phi, \pm \mu \hat{A} \dots \dots \dots$
4. $1526 v \tilde{N} s' s \pm \mu \hat{A} \mathbb{1} \mathbb{1} \phi \pm^{1/4} n M f^0 0 v, f \mu \hat{A} \dots \dots \dots$
5. $s' s \pm \mu \hat{A} J \mathbb{1}^0 0 \mathbb{1} \phi h \mu \hat{u} \pm \mu \mathbb{1} \phi \hat{A} \hat{A} v \tilde{N}$
 $\mathbb{1} \phi \hat{A} \pm \mu q^0 0 v, f \mu \hat{A} \dots \dots \dots$

αλφα-2 (TEST-2)

Ε1, i ± 1/4 ε Ê p ± μΑ.

h.É1/4:

hμ ± μSμi:

q, eμ* v Ê p ± μΑ.

Ê φ Α Α h μ α 0

¶ φ Α ± μ Α ö v Α: 5

For ñ 0 1/4 φ, q² v Ñ ¶ ± 1/4 Ê ± Α Ç Α ¶ m ¶ ± ¶ φ Α l u, ¶ m ¶ φ Α v Α
Sμ Α ± 1/4 α 0 v μ Α ¶ φ Α Α.

1. s' s ± μ Α 0 μ Α ¶ ¶ φ Α ± μ Α f μ Α I ¶ φ ± μ Α?

A) 0 μ i ± 3

B) ¶ ¬ Α ¶ φ Α ± Α μ Α Α ' m

C) ¶ ¶ ° 0 S i ± 3

2. $\Gamma \rightarrow \Delta \Gamma \Phi \tilde{A} \pm \tilde{A} \mu \tilde{A} \tilde{A}' m \text{ J } \Gamma^{\alpha} \Gamma \Phi \mu \tilde{\iota} \pm \mu \Gamma \Phi \tilde{A} \tilde{A} v \tilde{N} \text{ Cl } \tilde{\iota} / \neq 0, \pm \mu \text{ov } \tilde{N} \text{O}^{\alpha}$
 $\Gamma \Phi v \zeta \tilde{\iota} \Gamma m \tilde{A} ?$

- A) 1540 B) 1530 C) 1532

3. $\tilde{E} \cdot \pm^{\alpha}$, $\Gamma \rightarrow \Delta \Gamma \Phi \tilde{A} \pm \tilde{A} \mu \tilde{A} \tilde{A}' m \Gamma m \tilde{A} \text{ J } \pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{\iota} \mu \tilde{\epsilon} \text{ov } \tilde{N} \text{ M }^{\alpha} \text{ov}, f \mu \tilde{A} ?$

- A) $\text{Oum } \tilde{D} \gamma^{\alpha} \pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{\iota} \mu \tilde{\epsilon} \text{O}$ B) $q, n \Gamma p q \tilde{A} \tilde{a} \pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{\iota} \mu \tilde{\epsilon} \text{O}$ C)
 $\text{SDS}, \tilde{\iota} \pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{\iota} \mu \tilde{\epsilon} \text{O}$

4. $\Gamma \rightarrow \Delta \Gamma \Phi \tilde{A} \pm \tilde{A} \mu \tilde{A} \tilde{A}' m \text{ S } \Gamma \Gamma p \tilde{\epsilon} ?$

- A) $\pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{\iota} \mu \tilde{\epsilon}^{\alpha} \pm \mu \tilde{A} f \mu \tilde{A}$ B) $\neq \Gamma^{\alpha} \tilde{a} \text{ov } \tilde{A} \beta f \mu \tilde{A}$ C)
 $\Gamma p \text{of}^{\alpha} h \mu \tilde{A} f \mu \tilde{A}$

5. $\text{J } \tilde{E} \Gamma \neq \Gamma p \tilde{A} \pm, \gamma \tilde{A} \Gamma^{\alpha} \Gamma^{\circ} \pm \tilde{A} \mu \tilde{A} \text{oh } \tilde{D} \text{ 1555 } \Gamma^{\alpha} \Gamma \Phi \mu \tilde{\iota} \pm \mu \text{ov } \tilde{N}$
 $\text{Cl } \tilde{\iota} / \neq 0, \pm \mu \Gamma \Phi \tilde{A} \tilde{A} \Gamma m \text{O } \mu \tilde{A} \Gamma \Phi v, \tilde{\iota} f \mu \tilde{A} ?$

- A) $\Gamma p \pm / \neq 0 \pm \tilde{A} \mu \tilde{A}$ B) $\text{D } \Gamma p \tilde{\iota} \tilde{\iota}' m$ C) $\tilde{E} \Phi \tilde{A} \Phi, f^{\alpha}$

αξ'α - 3 (TEST-3)

ΕΙ, i±1/4ε Êp±μÀ:

hÊl'4:

hμ±μSμi:

q₃εμ*iv Êp±μÀ:

ËφÀÀhμào

¶φÃ±μÀövÀ: 5

FO²ñοΙμ Ε¶φösf²¶m hμ¶pÁýê (X) L¶pÁýêv¶mÀ ()

SμÀ±1/4ävμÀ¶φÀÀ.

1. ¶-À¶φÃ±μÀÃ' m Cομi±³ hμof²ñ.
()
2. Cομi±³ 'Ë±çh, ö±i ¶pμèin' ¶pñËφ¶Ëpd'áfμÀ.
()
3. Cομi±³ «, ¶φÃñγiné OÍné '¶²Àsû'vÀS,' EsûμZOV, fμÀ.
()
4. 'Es'lμh³-P'm,' CÊm q₃ ñ±μèμ, ¶φÀOl'4±, né Cομi±³
n±1/4ävμvÉlμÀ. ()
5. 'l'4' m - E - Ev'»- ' CÊm OÍñhμà ¶φÀh, né «, æ»pOwOl'4 Cομi±³
O, lμÀ. ()

$d\zeta' \epsilon \lambda - 4$ (TEST-4)

$E_l, i^{\pm 1/4} \hat{E} p \pm \mu \hat{A}:$

$h \hat{E} l^{1/4}:$

$h \mu \pm \mu S \mu i:$

$q_{\pm} e \mu^{*1} v \hat{E} p \pm \mu \hat{A}:$

$\hat{E} \phi \hat{A} \hat{A} h \mu \hat{a} 0$

$\mathbb{1} \phi \hat{A} \pm \mu \hat{A} \ddot{v} \hat{A}: 5$

$F 0^{\epsilon} \tilde{n} 0 l \mu E \mathbb{1} \phi \ddot{s} f^{\epsilon} \mathbb{1} m \phi, d^{\epsilon} n \gamma h \mu \mathbb{1} p \pm \mu \hat{A} v \mu \hat{A} \mathbb{1} \phi \hat{A} \hat{A}.$

- | | | |
|--|---|---|
| 1. 1605 | - | $\mathbb{1} m \hat{A} \pm \mu \hat{y} \mathbb{1}' m$ |
| 2. $\gamma \mathbb{1} \neg 0 S i^{\pm 3}$ | - | $^{\circ}, \gamma \mathbb{1}' m$ |
| 3. $\mathbb{1}^{\epsilon} \mathbb{1} \phi \hat{A} \pm \mu \hat{A} \epsilon \pm, v \hat{A}$ | - | $\mathbb{1} p \pm 1/4 q_{\pm} v \mathbb{1} m 0 \mu \hat{A}$ |
| $\mathbb{1} \phi v \zeta \hat{u} \mathbb{1} m \hat{A}$ | | |

$$4. \quad \mathbb{P}m\tilde{A} \pm \mu \dot{\gamma} \mathbb{P}' m \varepsilon \eta \pm \dot{A} \mu \tilde{A} \nu \mu \dot{A} \theta, \pm \mu \theta \mu \dot{A} f \mu \dot{A} - \\ \mathbb{P} \dot{\phi} \dot{A} \pm \mu g^{\rho} \theta \nu \zeta \mathbb{P} m \dot{A}$$

$$5. \quad 1627 \quad - \quad s \dot{u} \tilde{N} S \mu \nu \nu \mathbb{P}^{\rho} \dot{A} f \mu \dot{A}$$

$d\zeta' \dot{a} - 5$ (TEST-5)

$$\varepsilon l, i \pm 1/4 \hat{E} p \pm \mu \dot{A}:$$

$$h \hat{E} l^{1/4}:$$

$$h \mu \pm \mu S \mu i:$$

$g_{\pm} \epsilon \mu^{\ast} v \hat{E} p \pm \mu \hat{A}:$
 $\mathbb{P} \phi \hat{A} \pm \mu \hat{A} \ddot{v} \hat{A}: 5$

$\hat{E} \phi \hat{A} \hat{A} h \mu \hat{a} 0$

$s \hat{u}^{\prime} \pm \mu h \mu l \hat{E} \mathbb{P} \ast \mathbb{P} p d \mathbb{P} \phi \hat{A} \hat{A} v \tilde{N} F 0^{\epsilon} \tilde{n} 0 l \mu E \mathbb{P} \phi \ddot{o} s f^{\epsilon} \mathbb{P} m \mathbb{P} p \tilde{n} l \hat{E} \ast v \mathbb{P} m \hat{A}$
 $w \mathbb{P}^{\circ} \acute{e} v h \mathbb{D} S \mu \hat{A} \pm \prime / \hat{a} 0 \mathbb{P} p \hat{A} \mathbb{P} \phi \hat{A} \hat{A}.$

1. $G h \mu \hat{a} \pm \mu s \hat{u}^{\prime} \pm \mu h \mu l \hat{E} \mathbb{P} \ast 0$



2. $\mu 0 \mu \ddot{o}^{\prime} m \pm, \gamma^{\prime} i v \hat{A}$



3. $D S, \tilde{n}$



4. $I \bar{o} 0 \mathbb{D} d$



5. $f \hat{u}^{\epsilon} x \hat{o}$



αζ'α - 6 (TEST-6)

ΕΙ, ι±1/4ε Êρ±μΑ:

ηÊΙ1/4:

ημ±μSμi:

q, em*iv Êρ±μΑ:

ηφÃ±μΑövΑ: 5

ÊφÃÀημã0

- 1) FO²ñ0lμ Eηφösf²ηm sù'±μhμlÊη*ηpδ0vÑ fû²xôn
SμΑ±1/4ã0ηpΑηφÃÀ.



- 2) FO²ñ0lμ1/4 Eηφösf²ηm whμñ ηpδηφÃÀηmÀ vμÃ»²φ, ±1/4
Êρ±μΑôφ, ñ±ÀμΑof².





ḏç'â – 7 (TEST-7)

El, i±1/4æ Êp±µÀ:

hÊl'4:

hµ±µSµi:

q, em*iv Êp±µÀ:

¶φÃ±µÀövÀ: 5

ÈφÀÀhµào

¶Æ±ç¶m ¶¶φÃlû, ¶m¶φÀÀ¶mÀ s'ñoçd³vÑ ✓

SµÀ±1/4âo¶pÁ¶φÀÀ [] [X]

1) |φ, Z 1629¶φ ¶âo¶φhµi±µovÑ γνίον, fµÀ.

[]

[]

2) |φ, Z hÐ±mé, ¶pÁ±µolûµ±³, ±, ±ÀµÀSµf³, ¶Æ±µh³,

ÈφÀÀµËvç¶m [] []

q, ñoh, v¶mÀ «, ölüç¶m0 vÉ¶ÆÀoµÀm, éfµÀ.

3) 1674¶φ ¶âo¶φhµi±µovÑ vûµhµñ¶piS, t±µÀµÀ q'ïolç¶mÀ.

[] []

4) |ϕ, Z hμΠm ±, γiném, vÀSμÀ ±, °, àòvÀS, EsûμZOV, fuÀ.
 [] []

5) |ϕ, Z Πp ±1/4q, vΠmvÑ Π²Π° ±ÀμÀΠpfuf, n0² cΠ· àΠpñlû, ΠmÀvÀ
 gofÉϕ, ±μÀ. [] []

POST-TEST

dϕ'²à

Elû, i±1/4æ Êp ±μÀ:

q, em*iv Êp ±μÀ:

hμ ±μSμi:

ËϕÀÀhμào

ΠϕÃ ±μÀövÀ: 25

I. $F_{02} \approx 0.1/4 \phi$, $d^2 v \tilde{N} \approx \tilde{E} \pm \zeta \Pi m \approx \Pi \phi \tilde{A} \tilde{u}$, $\Pi m \approx \Pi \phi \tilde{A} \tilde{A} \Pi m \tilde{A} S \mu \tilde{A} \pm 1/4 \approx 0.0 \nu \mu \phi^2$.

1. $s' s \pm \mu \tilde{A} s \hat{u} \pm \mu h \mu \approx \tilde{E} \tilde{N} \approx 0^2 \approx \Pi p \tilde{A} \hat{y} \hat{e} \mu \tilde{A} \approx \Pi \phi \nu$, $\hat{u} \mu \tilde{A}$?

[I]

A) 1526 B) 1528 C) 1530

2. \circ , $\gamma \Pi \approx \Pi m \tilde{A} \approx \Pi \nu \tilde{A} \hat{E} p \pm \mu \tilde{A} \approx \Pi \tilde{E} \tilde{A} \hat{d}^2$?

[I]

A) $s' s \pm \mu \tilde{A}$ B) $\tilde{P} \tilde{A} \pm \mu \tilde{N} 0$ C) $\gamma \Pi - 0 S \hat{z} \pm \mu \tilde{A}$

3. $\Pi - \tilde{A} \Pi \phi \tilde{A} \pm \tilde{A} \mu \tilde{A} \tilde{A}' m \approx \Pi f^2 0 \omega \Pi m \pm$, $\gamma \tilde{A} \approx \Pi \phi \pm \mu \tilde{A}$?

[I]

A) $E s \tilde{N}^2/4 - 0 \nu \tilde{N} f^2$ B) $C 0 \mu \hat{z} \pm^3$ C) $\tilde{E} \tilde{N} \pm^3 \circ$,

4. $s' s \pm \mu \tilde{A} \approx \Pi \tilde{E} \tilde{N} \approx 0^2 \approx \nu \zeta 0.1/4 \approx \Pi m \phi$, $\mu \tilde{A}$?

[I]

A) $q_2 0^2 \ll \hat{a}' m$ B) $E 0 f^2 \pm \tilde{A} \mu \tilde{A}$ C) $\Pi \phi \tilde{A} \tilde{u} \mu \hat{z} D \gg^2 \pm \tilde{A} \mu \tilde{A}$

5. $S \hat{D} S$, $\tilde{N} \pm \tilde{A} \mu \tilde{A} \tilde{A} \tilde{u} \mu \hat{z} 0 \approx \Pi \tilde{A} 0 \approx \Pi \phi h \mu \hat{z} \pm \mu \approx \Pi \phi \tilde{A} \tilde{A} \nu \tilde{N} \approx \gamma \pm 1/4 S' / 4 0.1/4$?

[I]

A) 1527 B) 1529 C) 1530

II. $F_{02} \approx 0.1/4 \approx \Pi i \nu \approx \Pi m \tilde{A} \approx \Pi p \tilde{A} \pm 1/4 0 \approx \Pi p \tilde{A} \approx \Pi \phi \tilde{A} \tilde{A}$.

1. $\Pi m \tilde{A} \pm \mu \hat{y} \Pi \circ' m s \hat{u} \mu \pm \mu \hat{a} \hat{E} p \pm \mu \tilde{A}$

2. h , $\gamma \approx \Pi \phi \tilde{A} \Pi - \nu^3 n \pm$, $\hat{z} h \mu$

3. $C 0 \mu \hat{z} \pm \mu \tilde{A} \approx \Pi \tilde{A} 0 \pm \mu \circ \mu 0 \mu \tilde{A} \mu \tilde{A}$

4. $\dot{E}\phi\dot{A}\dot{A}\mu\dot{d}^e q_3 n\pi p\dot{d}\dot{A}\dot{a} \pm \dot{A}\mu\dot{A}\dot{A}\dot{A}\dot{u}\dot{m}\dot{e}\pi\phi\dot{A}\dot{A}$ -----
 $\pi^{\pm 0}\pi\phi h\mu\dot{i} \pm \mu\pi\phi\dot{A}\dot{A}\dot{v}\dot{N} \gamma^{\pm 1/4} S^{1/4} O^{1/4}$.

5. $\pm \zeta o f\mu\pi\phi q_3 n\pi p\dot{d}\dot{A}\dot{a} \pm \dot{A}\mu\dot{A}\dot{A}\dot{A}\dot{u}\dot{m}\dot{e}\pi\phi\dot{A}\dot{A}$ -----
 $\pi^{\pm 0}\pi\phi h\mu\dot{i} \pm \mu\pi\phi\dot{A}\dot{A}\dot{v}\dot{N} \gamma^{\pm 1/4} S^{1/4} O^{1/4}$.

III. $F O^e \tilde{n} O^{1/4} \phi, d^e v\tilde{N} h\mu\pi p\dot{A}\dot{y}\dot{e} (X) \mathcal{L}\pi p\dot{A}\dot{y}\dot{e}\dot{v}\pi m\dot{A} () S\mu\dot{A}\pm^{1/4} \dot{a} O v\mu o f^e.$

1. $s's \pm \mu\dot{A} 1530 v\tilde{N} \pi\phi\dot{A} \pm \mu g^e O v, f\mu\dot{A}$
 ()

2. $N \pm \mu O S\mu\gamma\dot{E}s\dot{A} h\mu o f^e \tilde{n}^{\circ}, \gamma\pi^{\circ} 'm$
 ()

3. $\ddot{E}\dot{E}^{\pm} n o\mu \mathcal{E} l\dot{u}, \pi m o v\tilde{N} \pi\phi\dot{A}\dot{A}\pi m\dot{i}s^{\pm} l, \pm^{1/4} \pi p l\mu\dot{e} h\mu\dot{A}\dot{v}\pi m\dot{A}$
 $\pi p\tilde{n}\dot{E}\phi\pi\dot{E} p\dot{d}^e \dot{a} O^{1/4} N \pm \mu O S\mu\gamma\dot{E}s\dot{A} ()$

4. $\pm, \gamma\pi p\dot{A} h\mu\tilde{n}^{\pm 3/4} \dot{a} O v\pi m\dot{A} \mathcal{E} \phi, \pi - O v\dot{E}\pi^{\pm} \dot{A} o\mu\dot{A}\pi m\dot{e} l^{1/4} C o\mu\dot{i} \pm^{\pm}$
 ()

5. $^{\circ}, \gamma\pi^{\circ} 'm s\dot{u}' \pm \mu\dot{i} \pi\phi\dot{A}\dot{A} o h, \gamma^{\pm} \pi\phi\dot{A}\pi - v^{\pm}$
 ()

IV. $F O^e \tilde{n} O^{1/4} \phi, d^e n \gamma h\mu\pi p \pm \mu\dot{A}\dot{v}\mu\dot{A}\pi\phi\dot{A}\dot{A}.$

	A	B
1.	$ \phi, \mathcal{Z}$	$h, S\mu\dot{A} f\mu\dot{A} C v\phi, d\dot{A} S\mu v\phi, f\mu\dot{A}$
2.	$C o\mu\dot{i} \pm^{\pm}$	$\pi p o f^e h\mu\dot{A} f\mu\dot{A}$
3.	$N \pm \mu O S\mu\gamma\dot{E}s\dot{A}$	$\pi\phi\dot{A}\pi^{\circ} \pm, \pi^{\circ} \dot{a} o n \pm, \dot{i} h\mu$
4.	$\pi - \dot{A}\pi\pi\phi\dot{A} \pm \dot{A}\mu\dot{A}\dot{A}' m$	$\ddot{E} \pm \zeta h, \ddot{o} \pm \dot{e} \pi p l\mu\dot{e} i$

5. $\eta\eta - \sigma\zeta\iota\pm\bar{\zeta}$
 $\eta\phi\acute{\alpha}\eta\mu\eta\acute{\alpha}\acute{\alpha}\mu\acute{\alpha}$

$\eta\acute{\alpha}\acute{\alpha}\sigma\acute{\epsilon}$

V. $F\ 0^{\epsilon}\tilde{\eta}0\iota\prime\pm\ E\eta\phi\acute{\sigma}\acute{\sigma}\acute{\epsilon}\eta\mu\prime\pm\ s\acute{\iota}\prime\pm\mu\eta\mu\iota\acute{\epsilon}\eta\kappa\prime\eta\eta\mu\acute{\alpha}\nu\tilde{\eta}\ f\acute{\iota}\acute{\epsilon}\acute{\epsilon}\acute{x}\acute{\omicron}\eta\eta$
 $S\mu\acute{\alpha}\pm\prime\pm\acute{\alpha}\acute{\omicron}\eta\eta\mu\acute{\alpha}\eta\eta\acute{\alpha}\acute{\alpha}$



$F\ 0^{\epsilon}\tilde{\eta}0\iota\mu\ E\eta\phi\acute{\sigma}\acute{\sigma}\acute{\epsilon}\eta\mu\prime\pm\ \omega\eta\mu\tilde{\eta}\ \eta\eta\mu\acute{\alpha}\eta\eta\eta\mu\acute{\alpha}\ \nu\mu\acute{\alpha}\gg\acute{\epsilon}\ \phi,\ \pm\prime\pm\ \acute{\epsilon}\eta\pm\mu\acute{\alpha}\acute{\omicron}$
 $\phi,\ \tilde{\eta}\pm\acute{\alpha}\mu\acute{\alpha}\acute{\omicron}\acute{\epsilon}$.



