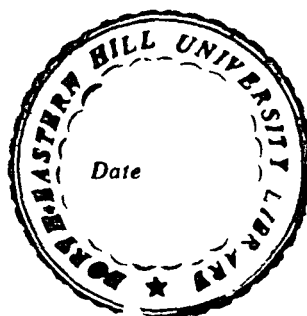


A COMPARATIVE STUDY OF
THE SCHOLASTIC PERFORMANCE OF
THE VISUALLY HANDICAPPED PUPILS
STUDYING UNDER THE INTEGRATED SYSTEM WITH THAT OF
THE NORMAL PUPILS IN SECONDARY SCHOOLS OF KERALA



LALI, S. M A , M Ed , M Phil.

THESIS SUBMITTED FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY IN EDUCATION
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1995

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Gift

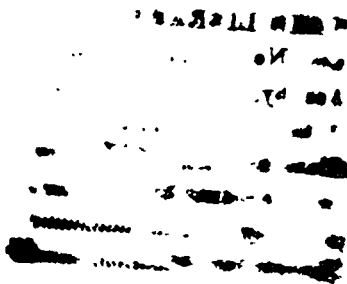
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DECLARATION

I, Lali, S., do hereby declare that this thesis "A Comparative Study of the Scholastic Performance of the Visually Handicapped Pupils Studying Under the Integrated System with that of the Normal Pupils, in Secondary Schools of Kerala" has not been submitted by me for the award of a Degree, Diploma, Title or Recognition, before.

Calicut University Campus,
22nd February, 1995.


LALI, S.



CERTIFICATE

I, Dr. P. Kelu, do hereby certify that this thesis "A Comparative Study of the Scholastic Performance of the Visually Handicapped Pupils Studying Under the Integrated System with that of the Normal Pupils, in Secondary Schools of Kerala" is a record of bonafide study and research carried out by Smt. Lali, S., under my guidance.



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Calicut Univ. Campus
22nd February, 1995

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Lali
LALI, S.

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CHAPTER - I

INTRODUCTION

NEED AND SIGNIFICANCE OF THE PROBLEM -- STATEMENT OF
THE SPECIFIC PROBLEM AT HAND -- TITLE OF THE STUDY
DEFINITION OF KEY TERMS -- VARIABLES SELECTED FOR
COMPARISON -- OBJECTIVES OF THE STUDY -- HYPOTHESES
OF THE STUDY -- PROCEDURE - SCOPE AND LIMITATIONS OF
THE STUDY -- ORGANISATION OF THE STUDY

INTRODUCTION

1. NEED AND SIGNIFICANCE OF THE PROBLEM

1.1 Problems posed by the idea of equality of educational opportunity

("Education for All" has been the cherished goal of the developed and developing countries since a very long time. The concept of total education did play a vital role in the implementation of the educational plans and programmes in almost all modern nations. We know that education, not only augments the growth of productive potentials of individuals and nations but also helps their cultural emancipation.)

According to the Indian concept, education is that which liberates one from all bondages and limitations. (The innate abilities, physical and intellectual, are nurtured and developed through proper education. That is why education is considered to be the 'birth right' of every human being who aspires to develop. But there are obstacles standing in the way of achieving this coveted goal. Some of these may be arising out of environmental conditions that obstruct equality of opportunity, while certain others arise out of genetic abnormalities. It is a fact that in the society, all children are not physically and psychically endowed with equal abilities and status. Some do not possess the mental health needed

to cope up with the educational pre-requisites and hence they are regarded as mentally retarded. However, a very few of them can be trained to a certain extent, for attaining self reliance. Yet another kind of disadvantage is that certain children are physically handicapped. They include the deaf, the dumb and the blind and those with other physical deformities. But to get educated and thus improving themselves is their birth right too. Hence teaching of the physically handicapped, especially the hearing impaired and the visually handicapped has become really a serious concern of modern society. This necessitates adoption of scientific techniques and methodologies.) Gestures and movements of lips and facial expressions are widely used for the education of the hearing impaired. But the question of teaching the blind, adventitiously blind that is, those who became blind after birth and the congenitally blind, that is those who never had the opportunity to perceive light and the beauty of the colourful world around, is still more difficult and calls for specialized training as well as technical and methodological adaptations. There are however some specialized institutions which take up the task of educating the blind. But there the children live and learn as a special group different in all respects from the normal children. This

has been found to create in them a sense of inferiority and a tendency to withdraw from the normal group.

Because of this, the idea of educating the blind in the same classroom with their sighted counterparts has recently acquired considerable momentum.) But how far the facilities available are being used, in what way do teachers and pupils view this type of education how far is the procedure effective, etc., have not been subjected to sufficient number of studies, especially in Kerala. The present study aims at bringing into limelight, the need and scope of the programme of the visually handicapped being educated together with the normal pupils as well as its effectiveness and academic problems.

(It has been pointed out that education of the disabled in general has gained momentum only recently. The concept of integrated education is still more recent.) What had been the situation earlier? During the early stages of human civilization, the disabled were almost neglected. As the society progressed and democratic outlook blossomed, social consciousness also attained new meaning. Eventually society began to look upon the disabled on equal terms with the normal. To start with, the partially disabled were easily integrated into the

common social set up. But regarding those with major disabilities, such an acceptance had always been more difficult. The problem was really complex and hence it has been difficult to draw such children to the main stream of social life. It is only after the advent of the Industrial Revolution which started in the second half of the 18th century in Europe, that serious concern about the rehabilitation of the disabled with the help of orthetic and prosetic aids gained considerable strength among the social planners and administrators. The popularisation of printing technology has been a land-mark in the spread of education. (The spread of education in turn aroused an increased sensitivity about the need for equal educational opportunity for all including the disabled. This outlook paved the way for the adoption of modern educational techniques and methodologies to bring up the disabled to the level of the normal citizen. Even though, initially the society wanted only to rehabilitate the neglected and the disabled children, later it has become an inevitable social necessity to educate and help those children to develop in all possible ways, utilising fully their psychic and physical capabilities. But in fulfilling these aspirations more problems have to be faced. It is true that the deaf, the dumb,

and the visually handicapped among the disabled pose serious problems in attaining the goal of providing opportunity for equality of education.) In spite of this equal opportunity was considered possible as individuals who have disabilities in a specific domain were found to be possessing special capabilities in certain other domains. If these strong points are identified and necessary instruction imparted to them, it is felt that it would bring about tremendous results, socially and economically. The only thing required is that they should be placed in congenial environments, so that their unexpressed resources can be mobilized and channalized to the welfare of not only such children but also of the community. This warrants programmes starting from early childhood education and care, education at the lower and upper primary classes and even at the secondary and higher secondary levels. Such programmes have to be aimed at the overall development of the personality of the disabled, including their cultural emancipation.

(We know that every child, as far as education is concerned, is a separate entity having its own rights, freedom and vision of social obligations. Hence special

attention and care are required in the case of every child to ensure its alround development. The disabled including the visually handicapped is no exception to this general principle. The only difference is that the latter group requires special consideration in view of their disability.

(It is with this conviction that the Government of India under the Ministry of Human Resources and Development gives relatively higher priority for the upliftment of the disabled. The Government have adopted a number of plans and programmes for the rehabilitation and continuous education of the group . Such programmes have gained more momentum with the declaration of the National Policy on Education (1986). The policy emphasised the importance of providing equal educational opportunity for the disabled, taking into consideration the specific needs of those who had so far been denied equality. This warrants bridging the gap between the normal and disabled as far as possible. The policy therefore aims at the integration of the physically handicapped including the blind with the normal members of the community. With this end in view, steps are being taken to enable them to develop intellectually along with their normal counterparts and to instill in them confidence to face life in a better way

with inner courage and enthusiasm. In the light of this vision, the question of educating the visually handicapped has been discussed in the National Policy on Education in detail. It has been pointed out in the NPE (1986) that it would be easy to accommodate and integrate the partially blind with normal children, but for the totally blind, special care and consideration would have to be given and suitable policies and feasible programmes formulated. However, in the Policy it has been discussed the feasibility of integrating the blind with the normal by providing enough training in tasks associated with daily living. This is considered possible by providing opportunity for mobility, by developing communication skills through the Braille language and by offering training helpful to master vocational and other skills. Some studies have been made in these lines and these have proved that the visually handicapped could progressively advance in the acquisition of alround development. Gradually and steadily they can be brought to the level of independent and self reliant ways of living. The NPE (1986) also visualizes the integrated system as the only and effective way to extend educational facilities to the visually handicapped. In tune with this idea, a separate specialized cell was started at the NCERT with a view to

foster the integrated system of education for the visually handicapped.

1.2 The Integrated System of Education for the visually handicapped--History, Need, Meaning and Scope

Under the integrated system, the visually handicapped children are educated with sighted children in public/private schools with the services of a resource teacher or an itinerant teacher. Though the system of educating the visually handicapped together with the sighted existed in the past, there were only stray cases. But during the 20th century, the concept got wider acceptance and thousands of visually handicapped children got the opportunity to attend regular schools and study together with sighted children, making use of modern scientific techniques and methodologies.

It is found that the integrated system of education has been undergoing many changes and adaptations during this long period of time. By the declaration of the International Year of the Disabled Pupils (IYDP) (1993) the idea of integrated education acquired new spirit and vigour with varied dimensions. The move for universalization of elementary education covered the disabled population also and this has led to the necessity of starting IED programmes

on a wide range ~~on a par~~ with the increasing number of disabled persons.

As envisaged in the Education Act (1921) integrated education is not only a moral right of the children with special educational needs, but it is their legitimate right as a member of the society. Many studies in the matter have proved that there are clear differences in the academic and social performances of the children placed under regular and special classes. Integration is a means and not an end in itself. In short even while being integrated those children who are in need of special attention should get it, so that the best possible educational outcome could be obtained. In other words, the success of any programme calls for the availability of the variety of aids and materials suitable for the teaching and learning of the visually handicapped.

Mrs. Warnock (DES, 1978) in her report on Education, views that the overall aim of education is the same for all children. These may include enlarging their knowledge, experience, imaginative understanding and awareness of moral values, developing their capacity for enjoyment and the skills needed for facing the world after formal education. In short, they should be able to live as self

reliant, independent and active participants of the society. This is a noble hope but in reality it is still quite far from the aspiration. In spite of the earnest attempts by all nations, to attain the goal of 'Education for All' the disabled children continue to be still disabled.

In the 1977 census, 54 million among the world population were reported to be visually handicapped. The number of the visually handicapped in India is the largest in the world. It is said that every fifth among the visually handicapped persons in the world is an Indian. According to the 1981 census, there were 4,78,657 totally blind persons in India. Under these circumstances, it has become imperative to take up the Herculean task of providing opportunity for educating the visually handicapped with a view to making them individually and socially good.

1.3 Integrated Education for the visually handicapped--Problems and Prospects

From experiences in the field, supported by research and other informations available, it can be concluded that the visually handicapped children lag behind the sighted ones in their achievements. A close analysis of the issue reveals that the sighted children have the visually perceptive knowledge recorded in their mind which in turn acts

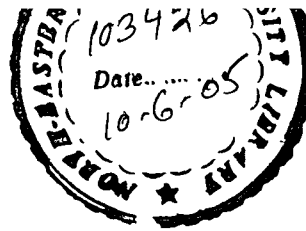
as the basis for perceptual thinking and understanding. In short, we perceive things through our sensory organs viz., ears, nose, tongue, skin and eyes and form clear and meaningful mental images and it is such meaningful schemas that enable us to learn and develop. Hence possessing efficient sensory organs is the root of learning. Of the sensory organs, eyes are considered to be the most important and visual perception is most crucial. So the visually handicapped who do not possess this faculty is the most disadvantageous. As thinking is a faculty, enriched and nurtured with the inputs of sensory organs in general and the eyes in particular, naturally the visually handicapped lags behind the sighted in their ability to learn. This theory has been developed by Piaget (1936) and Kupert (1977). They opined that higher levels of skill development requires proper perceptual stages of sensory organs with added efficiency of motor organs. Unless the sensory and motor organs function properly, a child cannot develop his thinking faculty and creative skill, to the desirable level. This deficiency has to be compensated, if such children are to be properly educated. With this end in view, several studies in this field have been attempted to make good the discrepancies experienced by the visually handicapped and

to raise their status to the level of normal children. This situation has been analysed by many and it has been found that acquisition of verbal learning with out appropriate foundation in concrete experience is one of the major problems in the education of the visually handicapped children (Harely, 1963). It is also reported that the extent of cognition is not only the reason for the poor performance of the visually handicapped, but the lack of the adequate parental support coupled with their socio-economic status. Ignorance and lack of interest among the parents widen the gap in concrete experiences required for learning. An impoverished experiential background affects not only cognitive development but also language development of the visually handicapped child.

We know that the sighted children acquire knowledge and skill not only from the teachers but also through the interactions with their peers, and the environment in which they are placed. The interactions are eye language, smile language, facial expression, gestures and vocal dialogues. A normal child acquires a lot of knowledge with the help of their seeing mechanism, but unfortunately the visually handicapped does not have this opportunity.

So in addition to the normal curriculum, the one prescribed for visually handicapped has to contain some more areas of education required for compensating the deficiencies arising out of the absence of visual communication. This is known as the "Plus Curriculum." Unless special skills are gained through the "Plus Curriculum," the visually handicapped child cannot be brought to the stage of integration, which in turn will result in not giving him educational opportunity and status equal to that of his sighted counterparts.

The visually handicapped lags behind others in acquiring knowledge, because of their inability to have visual experiences. It has been postulated that blind persons can be compensated for this, in many other ways. They are endowed with hyperactive sensitivity of the senses of hearing, touch, taste and smell. The visually handicapped child's other senses have more vigour and perceptibility compared to the normal. However, there are objections to this view too. Lowenfield (1980) has concluded that research evidences do not support this notion. But many agree with the former view and express that the gap is not so wide and could be bridged by compensation. The question of bringing them to the level of the normal child is possible, of course,



with the help of scientific appliances and adaptations. Discussions and deliberations have proved that if a concerted effort is made, in this field, with the support of modern technologies, we can go to a great extent to fill the gap between the sighted and visually handicapped. This view was supported by Spaulding and Brodie (1957) when they point out that retardation need not necessarily accompany the visually handicapped if adequate social and environmental experiences are provided.

Warnock Report (DES, 1978) points out that "purpose of education for all children is the same, the goals are the same, it is only the help needed, that is different." The sighted children gain an experience as a whole, the learning of visually handicapped children will be in parts, by accumulating pieces of information in instalments. Thus the sighted are having natural learning while the visually handicapped child is having mediated learning. So the visually handicapped child may have difficulty in forming exact concepts as they have to manipulate from parts to whole. Therefore there is a need for different approaches. At the same time, the curriculum for the visually handicapped need not entirely deviate from what is given to the sighted children, but modifications to

suit their special problems may become necessary. This may rather be in the strategies of curriculum transaction than in the curriculum content. The nature of the learning experiences will have to be different in view of what has already been explained. In short, what is required is an approach enabling the visually handicapped child to learn better through touch, hearing and other sensory sources.

The need for a differential approach in the learning procedure has been substantiated by other researchers also. According to Zweibelson and Bary (1967), the visually handicapped are inferior to the sighted counterparts in abstract thinking. They have unique and concrete empirical suggestions to prove the above postulate. Kirk and Gallor (1977) have proved through various tests, that there is only slight retardation in intelligence test in the case of the visually handicapped compared to the sighted. However, they inferred that, in the case of subtle intellectual powers involving complex and abstract reasoning supported by visual experiences, the visually handicapped fall behind the sighted. It is, therefore, observed that the fully developed imaginative skill is more or less absent in the visually handicapped. Hence the level of

abstract thinking and concept development of the sighted and the visually handicapped will differ unless the insufficiencies are bridged by utilizing the services of skilled teachers with the help of modern appliances.

It is not only the disability which creates all difficulties. The child should learn to live with that disability by not allowing it to affect his social life adversely. The child may have difficulty in forming exact concepts as they have to manipulate parts and reach the whole. That is, from the available mental data, he has to pool the fragments to make the perception complete. Living environment has a strong influence upon the personal and social adjustment of the visually handicapped. Negative or over solicitous attitude towards this population may make them feel inferior.

Since vision plays an important part in the shaping of human behaviour, and eye is the sense which interprets other perceptions, visual impairment has a far-reaching effect on all other aspects of development from the early childhood. According to Regnell (1979), nearly all the early stages of learning are visually dominated, and lay the foundation for many of the higher intellectual processes. Hence by the time, the visually handicapped starts

formal learning, they will be already one to two years behind their sighted peers in most aspects of intellectual activities. This has already been substantiated by Adair (1951) in his studies. This shows that expert teaching as well as expert medical treatment is needed to assess and minimise the effect of retardation resulting from visual handicap.

The blind also lacks in arithmetical proficiency requiring spatial skills enriched by sight (Nolan 1969). It is a fact that arithmetical ability is closely related to (1) general intelligence (2) spatial ability and its components (3) verbal ability (4) approach to problem solving and (5) neurophysiological correlates (Telfin & Sanvey 1961). The visually handicapped child faces difficulty in solving mathematical and physical problems (Chalfant & Scheffeln, 1969). Unlike the normal students in general class rooms, the visually handicapped has to undergo different curricular activities according to the specific needs of their disability. In short, the sum total of experiences of numerous formal and informal activities should also form part of the curriculum designed to the over all development of the personality of the visually handicapped.

In spite of all these differences in the learning strategies and the abilities of the two groups, the integrated approach has its advantages. When the visually handicapped studies along with the sighted in the same class room, he feels a sense of oneness, an inner strength and safety, induced by the close association of other students. We know that it is the duty of the society to provide opportunity to bring up the visually handicapped to the status level of the other members of the society with equal duties and responsibilities. Since they need special care and consideration by others, it would be advisable to adopt the integrated system as such, as care and protectiveness will be available more in the presence of others. The integrated system of education would be beneficial not only to the visually handicapped, but also to the sighted as it would enable them to develop positive attitude towards the blind, because of the possible interactions between the two in the common class room. This idea has been substantiated by Bateman (1967) in his studies.

It has already been pointed out that the visually handicapped though deprived of the visual experiences, have a lot of inner capabilities, seeking due expression. In an integrated system, provisions of such opportunities will

be more. Recreation and training will help the visually handicapped to derive mental satisfaction by being able to participate in such activities on equal terms with the sighted. Hence it is the duty of the planners and administrators to provide the visually handicapped equal opportunity to participate in activities such as singing, playing instruments, oratory, composing pieces of literature including poems, short stories etc. The visually handicapped, if given adequate feed back in physical training, can show tremendous progress in sports and games. Intellectual cum physical activities are also helpful for their successive and simultaneous advancement in physical and intellectual skills:

The need for a psychological approach and a positive attitude.

The attitude of parents also is of great significance in this regard. Pathak (1984) an educational psychologist, opined that the two common attitudes of the parents of the visually handicapped child are 'over protection' or 'extreme rejection.' He points out that both these attitudes are detrimental to the social and psychological development of the child. The first attitude makes the blind over dependent and less self reliant. The second one, on the other

hand, develops withdrawing tendencies. He insists on a clear awareness of the parents in particular and public in general of the need, for the visually handicapped child, occupying the same status despite his disabilities. Therefore, their outlook has got to be changed or modified, so that the visually handicapped would get all possible ways and means for his total development. Absence of this positive attitude, unfortunately, stands in the way of achieving progress towards the desired goal. Hence parents and all concerned should get effective guidance and education as to how they should deal with the visually handicapped in daily living and education. Only by understanding the delicate physical and psychological problems and needs of the visually handicapped, we can induce in them the confidence and motivation required for achieving normal development. The exact type of approach can be adopted only if the parents and teachers obtain scientific insight into the needs and morales of behaviour of the visually handicapped. For example, in the case of motor performance in visually handicapped, it has been pointed out that it will be advisable to have a little neglect rather than over protection. This is the learned view of Buel (1950). He has also expressed that a blind child must be considered as a

'child' first before giving consideration to his disabilities. In the absence of knowledge of such principles, we are likely to treat the visually handicapped in an unpsychological ways. In short, it will be desirable to give all possible encouragements to the visually handicapped to face problems of development on their own, as far as possible. At the same time, help should be extended when requested. Unless the visually handicapped is psychologically approached and treated in time, it would be impossible to rectify the dependency at a later stage.

Formation of an adequate self-concept depends on feelings and attitudes of others. This self concept, in turn plays a significant role in the education of the visually handicapped. Peers, teachers, neighbours and especially parents, shape a blind person's view of the self. Education can do a lot to improve the parents' perceptions and attitudes towards the visually handicapped.

Thus a wilful and learned effort on the part of parents and teachers is inevitable for the gradual and positive physical and mental growth of the visually handicapped children. A teacher who does not have general

Proficiency along with specialised training in the area cannot be a good teacher for imparting instructions to the visually handicapped. In fact, the ability to maximise instructional time, is considered as one of the most important abilities of a teacher of the handicapped students (Frederictors, 1977).

2. STATEMENT OF THE SPECIFIC PROBLEM AT HAND

It is evident from the discussion already made that correct procedures and practices meant for the proper integrated education of the visually handicapped have to be designed and implemented with utmost care. These should be based upon theories in the field substantiated by empirical evidences drawn from research studies. It is unfortunate to record that only a few such studies have been made in this area. There is acute dearth of researchers in this field, who could contribute by doing and supervising research in this almost neglected area of education of visually handicapped. Researchers would certainly come across with considerable difficulties for want of necessary literature and secondary data. Hence

they have seldom channelised their potentialities and time for investigation into the problems facing the visually handicapped. This dearth of researches is very conspicuous by the limited related entries in the four Surveys of Research in Education (Buch, 1974, 1979, 1984 and 1989).

More over, the present educational environment demands more innovations for a better teaching and learning climate, for which a collective effort on the part of researchers and educators is warranted. Only with such concerted effort made on the basis of co-operative and action-oriented research studies conducted under realistic learning environments can, integrated education of the visually handicapped gain strength. In this context, it has to be pointed out that even the very few studies in this area still remain as isolated attempts because of inadequate communication among the researchers. Such a state of affairs should never remain. Under these circumstances, it is felt that detailed studies are required with a comparatively wider communication and understanding. It is expected that

this would promote a will among those responsible for the uplift of the visually handicapped to provide the group with special care and attention which in turn will help to improve their living conditions. The present study is an attempt geared towards this goal. In this, effort is made to find out the nature of the performance of the visually handicapped pupils under the integrated system which might help to identify problems standing in the way of its successful implementation and to suggest remedial measures for removing those obstacles. It is with this end in view that the investigator thought of making a comparative study of normal pupils and visually handicapped with respect to their scholastic performance.

3. TITLE OF THE STUDY

"A COMPARATIVE STUDY OF THE SCHOLASTIC PERFORMANCE OF THE VISUALLY HANDICAPPED PUPILS STUDYING UNDER THE INTEGRATED SYSTEM WITH THAT OF THE NORMAL PUPILS, IN SECONDARY SCHOOLS OF KERALA."

4. DEFINITIONS OF KEY TERMS

Scholastic performance

Performance of pupils in appropriate forms of achievement test, based on educational outcomes in respective curriculum areas prescribed for three levels of education viz., Standards VIII, IX and X. The performance in the study has been given in terms of the achievement scores obtained in the tests. These include:

- 1) Achievement in Malayalam
- 2) Achievement in English
- 3) Achievement in Hindi
- 4) Achievement in Social Studies
- 5) Achievement in Physics
- 6) Achievement in Chemistry
- 7) Achievement in Biology
- 8) Achievement in Mathematics
- 9) Total Achievement in the above school subjects.

Visually Handicapped

A non-specific term applicable alike to the blind and to the partially seeing. For the purpose of this study, the visually handicapped pupils have been confined to totally

blind pupils alone. Through out the study visually handicapped means, the child who is 'educationally blind', that is as defined by Bourgeault (1975) those for whom Braille or alternative media is required for majority of formal learning, activities.

Integrated System

Educating visually handicapped children along with sighted children in public or private schools with the help of Resource teacher/Itinerant teacher is known as Integrated system of the visually handicapped. But in Kerala, for the integrated system no itinerant or resource teacher is appointed. Hence for the present study, it indicates a system in which visually handicapped and normal pupils learn in the same class.

Normal Pupils

Normal pupils in this context refers to the school going secondary school pupils studying during 1993-94 who have no visual handicap.

Secondary Schools of Kerala

Pupils who are studying in Standard^s VIII, IX and X in the State of Kerala during 1993-94. For the present

study, the schools having integrated system along were taken.

5 VARIABLES SELECTED FOR COMPARISON

Independent variable

The major factor, "blindness" that causes the differences in the scholastic performance of visually handicapped pupils and the normal pupils.

Dependent Variable

Achievements in each of the eight subject areas of the school curriculum, specified earlier, and the total performance is expressed in scores gathered by written tests.

Control Variables

The following variables have been used for obtaining the equated groups:

1. Intelligence
2. SES
3. Sex
4. Locality of Residence

6. OBJECTIVES OF THE STUDY

The study aims at comparing the scholastic performance of visually handicapped pupils and normal pupils of the Integrated System in Schools with a view to find whether there exists any significant differences. If differences are noticed, it is also intended to identify the major causes for such differences. Based upon this major goal, the following objectives are identified.

- 1) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 2) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 3) To test whether the two groups of visually handicapped pupils and normal pupils (standards VIII, IX and X) obtained by equating socio-economic status differ

significantly in their scholastic performance in the eight subject areas of school curriculum as well as in their total performance.

- 4) To test whether the two groups of visually handicapped and normal pupils of Standards VIII, IX and X obtained by equating intelligence and SES differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 5) To test whether the two groups of visually handicapped and normal pupils of Standards VIII, IX and X obtained by equating intelligence, SES, and sex differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 6) To test whether the two groups of visually handicapped and normal pupils of Standards VIII, IX and X obtained by equating intelligence, SES, sex and locality of residence differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 7) To test whether the two groups of visually handicapped

pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence and socio-economic status differ significantly in their scholastic performance in each of the three levels of cognition, viz., (i) acquisition of information, (ii) understanding, and (iii) ability to apply the understanding in new situations, with respect to the various subjects.

7 HYPOTHESES OF THE STUDY

7.1 Major Hypothesis

Visually handicapped pupils and normal pupils of the secondary schools differ significantly in their mean scholastic performance in various subjects of study as well as in their total performance.

7.2 Sub-hypotheses

1. Two groups of visually handicapped pupils and normal pupils of secondary schools, equated for intelligence will differ significantly in their mean scholastic

performance in the various subjects of study as well as in their total performance.

2. Two groups of visually handicapped pupils and normal pupils of secondary schools, equated for socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total performance.
3. Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence and socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study, as well as in their total performance.
4. Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence, socio-economic status and sex will differ significantly in their mean scholastic performance in the various subjects of study, as well as in their total performance.
5. Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence, socio-economic status, sex and residence will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total

was conducted on an initial sample of 855 secondary school pupils belonging to Standards VIII, IX and X (95 visually handicapped pupils and 760 normal pupils). After rejecting incomplete data entries etc., the data relating to 640 subjects of normal pupils were used for the final analysis. The equated groups for the three Standards (VIII, IX and X) were selected from this sample.

8.2 Tools

The data for the study were collected using standardised tests for measuring the dependent variables and control variables. The control variables were measured using standardised tools readily available and the dependent variables were measured by special tools developed by the investigator. Thus 24 standardised achievement tests were prepared for measuring the dependent variables in three standards (VIII, IX and X). The control variables were also measured by a test of acceptable validity and reliability. The following tools were used for collecting the needed data.

- 1) Measures of educational performance represented by achievement tests in eight curricular areas.
- 2) Kerala University Verbal Group Test of Intelligence.
- 3) The Kerala socio-economic Status Scale.

8.3 Statistical Techniques used

The investigator, made use of the following statistical techniques for the analysis of data.

- 1) Test of significance of difference between the means of large independent samples.
- 2) Test of significance of difference between the means of small independent samples.
- 3) Test of significance of difference between correlated means of large samples.
- 4) Test of significance of difference between correlated means of small samples.
- 5) Product-moment coefficient of correlation.

9 SCOPE AND LIMITATIONS OF THE STUDY

The aim of the study was to compare the scholastic performance of the visually handicapped and normal pupils with respect to the unselected samples as well as the equated groups. Thus the study provides some useful information regarding the capabilities and limitations of visually handicapped pupils under the integrated system. Identification of their areas of difficulties in the

different subjects of the curriculum, might help teachers to plan curriculum transaction and modify instructional strategies. The study also can help the parents of visually handicapped in understanding the problems resulting in their low performance in the school subjects and to help them to overcome these problems.

Even though the investigator has taken pains to make the study valid and reliable, certain limitations also can be pointed out.

The study could have covered children with varying degrees of visual impairment, but the present study has been confined to totally blind children only. School learning involves a wide variety of experiences leading to a variety of behaviour modifications. Of these, the first three levels of changes in the cognitive domain alone have been included in the present study. Moreover since the investigator had to prepare and standardise 24 achievement tests for the three Standards (VIII, IX and X), only those portions to be taught up to the first terminal examination were included while developing the achievement tests.

In the present study, the IQ scores of the visually handicapped have been measured by using the same IQ test,

used for measuring the IQ of normal pupils and that has been the verbal test of intelligence. However, since this had already been translated into the Braille language, there has been no problem in using the above test for visually handicapped pupils.

In spite of these limitations, the investigator hopes that the findings of this study will be useful for educators and for those who are concerned with the welfare of the visually handicapped children to plan integrated education programmes more effectively. The present study is the first serious research study relating to the education of visually handicapped in Kerala. Before this, there had been only one research study (Gopinathan Nair, 1984) at the doctoral level, which was a survey relating to the education of the visually handicapped.

10 ORGANISATION OF THE STUDY

The study has been presented in five chapters. The Introductory Chapter (Chapter I) presents the rationale for selecting the present problem and its significance. That section also contains a statement of the specific problem, the title, definition of the terms, the objectives of the study, hypotheses as well as the scope and limitations of

the study. Chapter II presents a detailed review of related studies. While doing so, the major trends observed in the studies have been summarised. Chapter III of the report describes the various aspects of the methodology followed viz., variables included, sample, tools and techniques used and the techniques of analysis adopted. Chapter IV presents the details of the analysis of data, followed by an interpretation of the major results. The last chapter (Chapter V) presents a summary of the study, major findings, educational implications of the findings and suggestions for further research in this area.

CHAPTER - II

REVIEW OF RELATED LITERATURE

INTEGRATED EDUCATION : ITS MEANING, SCOPE AND FORMS
-- ROLE OF TECHNOLOGY IN THE EDUCATION OF VISUALLY
HANDICAPPED -- EMPIRICAL STUDIES RELATED TO THE
TOPIC -- STUDIES CORRELATING THE VISUAL HANDICAP
AND SCHOLASTIC PERFORMANCE -- STUDIES RELATED TO
THE FOUR CONTROL VARIABLES -- STUDIES RELATED TO
INTEGRATED EDUCATION OF THE VISUALLY HANDICAPPED--

REVIEW OF RELATED LITERATURE

This chapter consists of two parts. Part 'A' deals with the survey of literature on theoretical discussion concerning the Integrated System - its meaning, scope, forms etc., as well as the role of technology in the education of the visually handicapped.

Part 'B' gives reviews of certain empirical studies related to the topic. It is done under three major heads:

- (i) Studies correlating the visual handicap (the independent variable) and Scholastic performance (the dependent variable).
- (ii) Studies correlating the four control variables, viz., Intelligence, Socio-Economic Status, Sex and Locality of Residence.
- (iii) Studies related to the Integrated Education for the visually handicapped.

These are presented below in the order specified.

PART - A

1 Integrated Education - Its meaning, scope and forms

The special significance and scope of integrated system of education of the visually handicapped has always

been discussed while pointing out the significance of the topic in Chapter I. In addition to the views of experts presented there, the opinions raised by certain others are given below:

Integrated Education (Ahuja and Kaur 1989) for the disabled child in to a regular classroom situation means, a concurrent education with a class of non-handicapped children: In such a set up, there are greater opportunities for the handicapped child to mix with his non-handicapped counterparts in games, sports and other activities. The handicapped children have to be treated as normal children having some physical disability and yet capable of functioning as responsible and contributing members of the community. Integrated Education is not just an alternative, but a necessity especially in the Indian conditions.

According to Bourgeault 1970 Integrated system is practical and can be achieved at minimum cost. This system provides a climate of acceptance for the blind treating him on par with the sighted. Many methods and materials used in the normal schools for the seeing children can be made use of, for the visually handicapped also with some minor modifications.

Integrated education programmes take many forms

In spite of slight variations, all of them have the common goal of giving blind children maximum social and academic experience with their sighted peers. The following presents a summary of the survey made in this respect from the publications already referred (Jangira and Mani, 1990) (Mani, 1991).

1. Resource model for the densely populated areas.
2. Itinerant plan programme for the considerably scattered population.
3. Dualteaching models for non-residential schools.
4. Co-operative plan for multiply disabled children.
5. Cluster model for hilly areas.
6. Multi-skilled teacher plan.
7. Programmes with partial integration.

1.1 Resource room plan

In the resource room plan visually handicapped children are placed in regular classes. The regular teachers are responsible for their general educational plan. There will be a specially trained teacher for the visually handicapped who will take the responsibility of teaching special subjects to them by providing special materials like special maps, braille text books, braille writing equipments, reader services in a resource room set up in

the school.

1.2 Itinerant Teacher Plan

This model is useful for places where visually disabled children are scattered and the transportation facilities are inadequate. In this, the visually handicapped children attend their regular neighbourhood schools and attend the regular classes along with the sighted children. A specially trained teacher (itinerant teacher) travels from school to school, bringing materials and the necessary equipments. The itinerant teacher helps in tutoring the visually handicapped children and holds discussions with the teachers and administrators about the special problems faced by the visually handicapped children.

1.3 Dual teaching model for non-residential schools

This model helps the universalization of education to the disabled children. This system is more beneficial where the educational facilities for this population do not exist. For example, an isolated village which has one or two visually handicapped children can very well go for the dual teaching plan. Here the regular classroom teacher will be assuming the responsibility for developing the special skills in the child in addition to his classroom

responsibility. The regular teacher with support of instructional materials and competency based training can look after the visually handicapped children in addition to their regular classroom responsibilities. For this, a token incentive is given for additional work. A large number of teachers, at least one teacher per school has to be given training of two to three months duration to serve in the dual teaching plan. When such arrangements are made, any disabled child can avail the educational facility in his local school itself.

1.4 Co-operative plan for multiply disabled children

The number of residential schools are very limited. It cannot accommodate the large population of disabled children. So all multiply disabled children cannot be benefited by the existing residential facilities. Such co-operative sections in normal schools would also be necessary in localities where residential schools are not available.

1.5 Cluster model for hilly areas

There are several hilly areas in the country that lack in access to transportation facilities. Reaching from one place to another itself takes days due to the

topography. In such places, organization of cluster model ~~is more~~ practicable. This model envisages satellite centres in different regions with decentralised service delivery system. Regional Resource Centres are established to take up the responsibility for administration. The cluster centre can provide over all supervision and guidance.

1.6 Multi-skilled teacher plan

This system also have been used in areas with scattered population. In rural areas, it is costly to appoint specialist resource teachers for specific disabilities. Moreover, when a specialist teacher is available in an institution, children with other disabilities do approach. It is difficult to tell the parents that a hearing impaired child is to wait, while a visually handicapped child in the same common school receives special service. At the same time if a multi skilled teacher is available he can serve all the disabled children. With a view to strengthening, multi-skilled teacher training programme has been designed by the NCERT.

1.7 Programmes with partial integration

In this system, the children attend the regular schools

for their education and stay in the hostels of residential schools. Where no alternation is possible and viable for organising full fledged integrated programmes, this partial integration could be followed. It is a good step to break isolation of special residential schools.

2. Role of Technology in the Education of Visually Handicapped

Technology in general and Educational Technology in particular has come forward with a variety of implements and techniques for the effective education of the visually handicapped. A brief survey of such technological inputs is attempted below.

These have been summarised from Hapeman (1967) Guldie Dorothy (1977) Scione (1978) Dodds Allan et al. (1984) Frie (1987) Aldrich and Parkins (1988) Jangira and Mani (1990).

2.1 Braille Master

The sudden emergence of electronic devices paved the way for the invention of Braille Master by which automatic translation of normal letters, to braille and Vice-Versa become possible. The machine is very much like a typewriter containing normal and mechanical brailier. This can be operated by both the sighted and the visually handicapped.

2.2 Computer assisted instruction and production of brailles

This is an era of computers and as such the use of computers is being utilised in the field of educating the visually handicapped. In this, an enormous data can be fed and regulated by commands. The computer can work for a longer period, simultaneously giving the braille output. The questions are answered by the computer in braille. The Versa Braille and Braille 400 computers have brought about tremendous advance in this field.

2.3 Relief Copy Machine

This machine is designed to produce relief of writing both in print and handwritings. It contains a part of copying machine and a foaming unit. Figures, dots, lines illustrations, letters etc. are copied on a relief copy paper. Thermal treatment is applied by the other part of the machine, i.e., the foaming unit. The dark plate will get converted to a relief copy.

2.4 Talking Calculator

It is really wonderful to note that a special kind of calculator can talk on a proper command. The visual images of the words are translated into sound by the help of this electronic device. However this machine is very

costly and hence not within the reach of an ordinary school.

2.5 Optacon

This machine is of the size of a dictionary and it weighs three kilograms. It is operated by using batteries. The part of the machine - the probe having the size of a lipstick, acts as a camera of a television. The probe has a little window through which it can 'see' an area about the size of one letter. The machine magnifies the images received through the probe and arranges them in the required order.

2.6 Close Circuit Television

This can be used in the case of students with low vision. With the help of a television camera, images of letters are enlarged. This can easily be read by low vision pupils.

2.7 Harmonic Compressor

This device helps to double the rate of recorded speech without disturbing the quality and vocal pitch.

2.8 Aural reading machine

The required information can be read by a process of scanning.

2.9 Taccomm

It is a small machine of the size of a cigarette packet. This consists of a radio receiver and a transmitter. It can produce vibrations and gain tactile warning to the persons. This device is used by the hearing impaired and the visually handicapped.

2.10 Collapsible Cane

This is in the form of a walking stick. This technique, called swaging, requires a very special machine, a swaging machine.

2.11 Sonic guide

This device contains ultrasonic sensors mounted on a pair of glasses. Signals of sound reflected from objects within its limit are perceived. The variations in the sound and its intensity help the user to know of the distance, direction, etc. of the object.

2.12 Bliss passive detector

This is a device converting optical images into

sympathetic vibrations or sounds. This is the same as the one used in a flash-light.

2.13 The Path sounder

It is a very useful device for a blind traveller. The cane shaped device helps the blind traveller to get the information of an obstacle, even beyond the reach of the cane.

2.14 Laser cane (Guldie Dorothy, 1977)

Three gallium arsenide lasers and three photo cells are inbuilt in a long cane. By this objects in a certain distance will be sensed. The signals emanate from this device are (1) tactile signal to the finger tip of the user regarding the obstacles and (2) a warning sound irrespective of the obstacles ahead.

2.15 Artificial vision

Certain experiments for providing artificial vision to the visually handicapped are progressing.

In India, the first attempt for integrated system of education was started in Bombay in 1958, admitting Blind boys in a regular school at the age group of 10 to 20 years (Tomboli 1984). However, due emphasis was

not given till recently to this particular type of setting. The integrated system brings forth the social concept of mainstreaming of the blind with a view to giving him equal educational opportunities at the right time along with the normal child. The integrated education programme if well executed would no doubt bring about considerable achievements.

PART B

3 Empirical Studies related to the topic3.1 Studies correlating the visual handicap and scholastic performance

The main problem faced by a classroom teacher of the visually handicapped is to locate the exact nature of the difficulties experienced by them in learning the academic school subjects so that appropriate strategies could be designed. Many studies geared towards this, have been conducted. This include those directly correlating the visual handicap and their scholastic performance as well as those dealing with psychological problems of the group, that stand in the way of improving their scholastic performance. Certain such studies are surveyed in this section.

Koch and Ufkess (1926) conducted a study on the effect of visual handicap on learning. They compared 19 visually handicapped children with normal pupils in their performance in a stylus maze. The groups were matched with respect to intelligence. It was seen that the visually handicapped students were inferior to the normal students in their performance.

Advani (1965) tried to identify the Educational and Psychological problems of the Blind children in the age group of 7 to 21 years and identified the major educational problems: shortage of text books, unplanned curricula, unqualified and poorly paid teachers, negligence of vocational and social training, and absence of intelligence tests for blinds.

Karlhein Oeldori (1970) compared the intelligence of partially sighted students attending regular classes with that of the normal students and understood that the average IQ of the partially sighted students was lower than that of the normal students. The lower intelligence of the partially sighted group was also reflected in their verbal performance parts.

Schluppir (1973) studied the level of achievement of partially sighted students in regular class room and concluded that the partially sighted students performed at a lower level in two areas--Georgraphy and Arithmetic.

Hill (1973) studied the Social Integration of Blind Adults and found that after learning in schools, the respondents showed uneasiness in interacting with persons who were normal with sight. Mobility of these people was found to be very limited and this reflected in the absence

of many daily living skills.

Sing (1974) compared the effectiveness of programmed learning materials on the achievement of blind and sighted, in modern mathematics taught, using different methods and found that, programmed learning is more effective than the other traditional methods.

Bateman (1976) investigated on the sighted children's perception of the blind children and found that those who actually know the blind children appraised their abilities more positively than who do not. Such positive appraisals increased progressively from grades three through six with the number of blind children known, and urban children were found to be more positive in their appraisals than the **rural** children.

Swilliam, Keibaugh (1977) surveyed to determine the attitude of class room teachers towards their visually handicapped students. Investigations were also done for the four areas such as teachers knowledge about their handicapped conditions, materials and instructional techniques, responsibility for the students and supportive services. It was found that teachers having previous contact and had previous exposure to special education were slightly more

positive in their attitude towards the students. On the whole, little difference was found between groups. Most teachers thought, the four areas investigated were important but showed a lack of experiment over standards that the visually handicapped student should be required to meet in the regular classrooms.

Bhargava and Lavana (1981) compared the personality characteristics of Sensory Disabled and Normal Children and found that the blinds were more reserved, secure and relaxed than their counterparts--the normal children.

Bartholome W. Johnette (1981) studied the effect of using calculator to the improvement of mathematical skills. Thirty five visually impaired adults were tested before and after a period of training. It was found that there was eighty seven per cent improvement in their mean post test scores than their mean pretest scores. It is inferred that by giving proper training and expertization, the visually handicapped children are capable to develop good mathematical skills.

The National Institute for the Visually handicapped, India (1981) conducted a comparative study of the manneristic behaviour of the blind and the sighted children and

found that mannerisms were found only in blind children. No manneristic behaviour was observed in the sighted children at play. The sighted girls showed fewer mannerisms than sighted boys but blind girls scored higher than blind boys.

Sinha (1982) examined the personality adjustments of the blind students in the age group of 7 to 22 years. The findings indicated that the blind children are as good in adjustment as others. The reason for the findings may be the habitational situations of the respondents. All the respondents were residents of the hostel living in similar physical and social environment and all interacting with one another within the same peer group. It is also noted that, the blind children without undergoing interaction with the outer world, have developed a sort of adjustment to the situation where each one is sympathetic to the other, because all of them are victims of the same handicap.

Akkammadevi (1984) compared the tactile discriminative ability of visually handicapped and sighted children of Standards I to V at Palayamkotta. The study was conducted with a sample of 40 students (20 sighted and 20 visually handicapped children). She found that the

tactile discriminative ability of the visually handicapped children is better and the level of achievement is higher when compared with their normal counterparts.

The National Association for the Blind (1984) surveyed the educational facilities available in Mehsana district and found that majority of the blind students were not getting proper emotional support or encouragement from their parents. In some cases, the blind children received help even after school hours from the regular school teachers.

Kumudhini Pino Swamy (1984) surveyed the Educational and Psychological Problems of the Visually Handicapped Children and found (1) scarcity of braille books and (2) disparity of age among the students.

Sing and Prabha (1984) evaluated the educational facilities for physically handicapped in school of Bihar and found that physically handicapped students were well adjusted with their families but there was lack of communication between such students and their non-physically handicapped class-mates.

Kesavan (1985) measured the attitude of parents towards their children who are visually handicapped and inferred that the parents living in rural areas have more positive attitudes towards their visually handicapped

children than the parents in urban areas. The parents of lower income group and higher aged group show more positive attitude towards their visually handicapped off-springs.

Saritha (1985) compared the adjustment pattern of the visually handicapped and the sighted students in the age-group of 14-18 years. The study revealed that there was a significant difference between the mean scores of visually handicapped and the sighted on social, emotional and educational adjustment.

Latha (1985) measured the impact of parental attitude on social, emotional, and educational adjustment of normal and handicapped students in Agra with 75 normal and 75 handicapped students. By the study she found that the parental attitude did not differ significantly for normal and handicapped students. Normal childrens showed significant difference from handicapped children in adjustment. But parental attitude did not affect significantly the adjustment of normal students. The attitude of parents affected significantly the adjustment of handicapped girls but did not affect the handicapped boys.

Zehran (1985) in his study of personality difference between blind and sighted children and found that the blind

were more introverted than their sighted peers. The visually handicapped are high on neurotism.

Pandey (1985) studied the affectional deprivation, ego-strength and adjustment pattern among visually handicapped children and their rehabilitation with a sample of 40 students in Gorakhpur. He found that the deprivation as felt by rural blind children was significantly more acute than that felt by urban blind children. There was no significant difference in the pattern of affectional deprivation between congenitally blind children (CBC) and post blind children (PBC).

Jain Prakash Singh (1986) compared the comprehension skills of sighted and visually disabled children of Standard IX in English subject revealed that the development of comprehensive abilities are a little slow in visually disabled children, comparing with the sighted of the same age-group. But there exists a highly significant difference between the comprehension abilities of the sighted boys and the visually disabled boys.

Sahaya Mary, (1988) studied the attitude of visually impaired children towards vocational education in the four districts of Tamil Nadu and found that there is a high positive attitude among the Visually Impaired Children

towards vocational education.

Ramasubramanian (1989) in his investigation compared the motor skills exhibited by visually handicapped children of Standards VI, VII and VIII and proved that the practice and training are very useful to the visually handicapped for the development of motor skills. He also inferred that through integrated education, there is no difference between the visually handicapped and the sighted.

Indira Sundar (1989) has encountered some difficulties faced by visually handicapped children of Standard VII in learning Algebra and found that all the teachers followed oral method of teaching and omitting the different portions of the subject. The teachers recommended 'Taylor Form' for teaching and learning algebra. Majority of the students faced difficulty in tasks like identifying the variables and constant, use of negative numbers, translation of word problems into symbolic basic operations, etc.

Mary C. Sapo (1991) studied the characteristics of socio-moral attitude of senior elementary students in special schools and regular schools in Hongkong and found that the socio-moral cognitive assignment were surprisingly similar

between the two groups. Differences in motivational orientation and teacher perception and socio-moral attitudes were much more noticeable in the case of students in special education rather than regular students. The distribution of students according to socio-moral categories of motivational orientation indicated that a larger percentage of students from regular school was categorised as collective motivation--stable orientation, while a large percentage of special school students appeared in the conflicting motivation-individual orientation category.

Satheesh (1990) compared the reading speed in language (Tamil) of the visually disabled and the sighted students and concluded that the visually disabled students are much lower to that of sighted students. But visually disabled male students performed better than visually disabled female students in reading. The variance of visually disabled female students is much lower than that of sighted female students. The grade level has no major impact on speed in reading.

Mandaravally (1991) analysed the cognitive development in visually handicapped children in Mysore with a sample of 190 visually handicapped children in 1st to 7th

grades in the age group of 6 to 16 years. She found that visually handicapped children attain concrete operational stage (COS) later, as compared with sighted children. The study further showed that there was no significant relationship between CDS and the sex of the visually handicapped children. She also observed that a marked degree of developmental lag, in the cognitive development of the visually handicapped children.

Nandita Basu Roy Nee Sen (1992) studied the Reading characteristics of the sighted and the blind school students and found no significant difference among the blind and the sighted, in the speed of reading, difficulty level of reading materials, comprehension level and errors made in reading. As regards fluency and clarity in reading, both group had no difference.

Panday, and Mohanty (1993) has conducted a study to ascertain the variations in the level of reading characteristics of the visually handicapped and the sighted children and concluded that if the intellectual level of blind students is similar to that of the sighted students, they are equally good in their learning abilities. That is, there is no significant difference between the blind and the sighted students on the tests of comprehension, picking of wrong

words and speed test.

Susan Larson (1994) studied the adaptive behaviour of learning disabled low achieving and normal achieving elementary school children, through the teachers' judgements. The teachers described, the students with Learning Disabilities as being more distractable than Normal Achieving and Low Achieving Students. The Learning Disabled and Low achieving students were described as more dependent than the Normal Achieving students.

3.2 Studies related to the four Control Variables (Normal Pupils group)

Though not directly, visual handicap and scholastic performance, in general, with variables that influence learning, are also important, the exact nature of their relations will help in analysing the problem under study. As such the four control variables viz., Intelligence, Socio-Economic Status, Sex, and Locality of residence are of significant. Hence certain empirical studies based upon the relation between scholastic performance and these variables also were surveyed. Some of these are summarised below:

3.2.1 Intelligence

Crowford and Burman (1942) found a positive correlation between intelligence and academic performance. Rao (1965) measured the relationship of intelligence and academic performance of the eight grade students in Delhi school and found that intelligence is a positive variable of scholastic performance. Through the study conducted by Chatterji and Gupta (1970) and Ramanath (1972) proved that there is relationship between intelligence and achievement. Dugas (1962) proved that IQ is positively related to achievement. Gowri Kutty Amma (1968), Gupta (1968) and Vasantha Ramkumar (1969) realised that there exists high positive correlation between intelligence and scholastic performance.

Kunju (1973) explored the relationship between intelligence and achievement among the SC/ST students in Trivandrum District and arrived at a positive relationship.

Santhamma Mathew (1974) got positive significant relationship between intelligence and academic performance.

Lalithamma (1975) confirmed a positive relationship between intelligence and performance in Mathematics. Govind Tiwari (1976) found positive correlation between scholastic achievement and intelligence. Iyer (1977) showed significant

relationship between intelligence and academic performance. Pathak (1977) studied the factors affecting high and low achievers in science, and found that high achievers have higher than the mean IQ than the low achievers. Rao (1977) identified the variables related to the scholastic achievement as intelligence, study habits and attitudes.

Samsanand Raj and Rita Krishnan (1980) tried to determine the extent of relationship of academic achievements to intelligence, socio-economic status and family size and observed that achievement has positive and substantial correlation with both intelligence and socio-economic status.

Rajput (1984) studied the academic achievement of students in Mathematics in relation to their Intelligence, achievement motivation and socio-economic status and found that intelligence affected the achievements of the students in Mathematics significantly at all three levels (high, Average and Low). The socio-economic status affected the achievements of students in Mathematics.

Mitra (1985) studied the determinant of academic achievements of pre-adolescent in Calcutta and ascertained that intelligence is the most significant correlate irrespective of sex. There was no sex difference at the pre-adolescent level

with regard to intelligence and achievement motivation.

Kaile and Bajwa (1985) explored the extent of intelligence with achievement in Science across different levels of socio-economic status and found that there is significant relation between intelligence and achievement in science. But it does not vary at different levels of, socio-economic status.

Dixit (1985) compared the intelligence and academic achievement of adolescent boys and girls studying in classes X and XI and found that girls are superior to boys in achievements. Among the class IX students, there was no difference in academic achievements of intellectually superior and intellectually very superior boys and girls.

Harish Sharma and Sushama (1985) studied the intelligence, achievement motivation and adjustment of the juvenile delinquents and inferred that the relationship between intelligence, achievement motivation and adjustment was positive and significant. Gokhar (1985) conducted a study on the effect of intelligence, creativity and achievements in Mathematics and found that intelligence and creativity are equally good predictors of achievements in Mathematics.

Sing (1986) studied some possible contributing factors

to the high and low achievements in Mathematics in respect of the high school students of Orissa and found that achievements in Mathematics was positively and significantly related with intelligence, socio-economic status and study habits.

Mahrotra (1986) measured the relationship between intelligence and socio-economic status, anxiety, personality adjustments, and academic achievements of high school students and proved that there was positive relationship between socio-economic status of the family of the students and their academic achievements and intelligence.

Yadav (1986) measured the effect as to whether academic achievement, age and parental income are interrelated with each other. The study was confirmed with a population of 38 X grade students. It was found that IQ is a predictor of achievement. Further intelligence academic achievement and parental income are seen associated with each other.

Despande (1986) studied the interactive affects of intelligence socio-economic status of students, and their home work achievements and found that intelligence was significantly related to achievements. Students from middle and upper socio-economic status had a more favourable attitude towards homework.

Venugopal (1994) studied the influence of intelligence and achievements among middle school level pupils revealed that achievement is related to intelligence, parental educational status, occupation and income. The intellectual abilities influence the achievements of pupils in knowledge, understanding, application and psychomotor skill objectives.

3.2.2 Socio-Economic Status

Coleman (1940) Ames (1943) showed a positive relationship between socio-economic status and pupils' academic achievement.

Frankel's (1960) proved that family background and socio-economic status are positively related to achievements. Das and Das (1962) found that the socio-economic status and academic status of pupils are related. Wilson (1963) understood that socio-economic environment and academic performance of pupils are significantly correlated.

Warrier (1966) found that there is significant relation between socio-economic status of parents and academic performance of children. Srivastava (1967) identified the factors related to under achievement and found that under achievement is related to factors like age, socio-economic status, number of siblings and birth order, etc. Rao (1970) investigated the

factors related to scholastic achievements and proved that socio-economic status was not significantly related to the prediction of achievements.

Abraham (1971) found significant relation between socio-economic status of parents and academic performance of pupils.

Ramoji Rao (1977) studied the academic performance of socio-economically disadvantaged children in Madras. The study revealed that socio-economically disadvantaged students were poor in academic performance.

Contractor (1977) measured the relationship between socio-economic status of the family and scholastic attainment and understood the possible relationship.

Venkatesh (1980) explored the levels of achievements of students with different socio-economic status and confirmed that achievement of the pupils depend upon the socio-economic status of parents.

Venkataiah (1980) examined the relationship between achievements of different socio-economic status in a sample of 300 Arts students and 300 Science students and inferred that socio-economic status was positively related to the academic performance of both arts and science students.

Amma (1981) studied the influence of socio-economic status and the academic achievements of SC & ST students and revealed significant difference between them.

Rita Krishnan (1982) attempted to study the school achievements of pupils belonging to different socio-economic status and found that as the socio-economic status decreases the level of scholastic achievement decreases and vice-versa.

Abdulla (1982) studied the relationship between socio-economic status and achievements in languages and concluded that there is positive relation between socio-economic status and achievements.

Chopra (1982) in his study identified the variables having positive relationship with academic achievements and found that socio-economic status is a pre-requisite for smooth completion of studies.

Elsyamma (1983) established the significant correlation with achievement in Malayalam and occupation, income and education level of parents.

Beena Shaw and Anshu Sharma (1984) assessed the effect of family climate on academic achievements and understood that there is positive relationship existed between family

climate and academic achievements. Further, it was found that family climate has a high influence among girls compared with boys.

Shukla (1984) studied the achievements of primary school children in relation to their socio-economic status and family size and found that socio-economic status is significantly related to academic achievement.

Sharma (1985) measured the levels of control among high and low achievers at different levels of socio-economic status and confirmed that there is no difference in levels of control in relation to academic achievement and sex; academic achievement and socio-economic status; sex and socio-economic status; and achievement and sex.

Jagathamma (1985) measured the impact of socio-economic status on academic achievements with a sample of 586 rural children of V, VI and VII classes studying in different schools of Sri Venkateswara University area and found that socio-economic status in rural areas has no influence on the educational attainment of pupils. But on the other hand, type of family, father's education, type of home are the contributing factors in achievement.

Kelu (1986) found that socio-economic status of the

family discriminate High Intelligence under-achievers and Low-Intelligence under achievers in the positive direction.

Binarani (1986) studied certain socio-economic correlation in English achievement of secondary school pupils and found that socio-economic status of parents is a prerequisites on achievements on different school subjects.

Misra (1986) studied the influence of socio-economic status on academic achievements of higher secondary school students in rural and urban areas of Kanpur and identified a positive relationship between their socio-economic status, intelligence and academic achievements. The academic achievements of the rural students were lower than the achievements of the urban students. The academic performances of girls were superior to the performance of boys.

Mohammed (1987) studied the effect of socio-economic status on achievements in English and found that there exists positive correlation between socio-economic status and the pupils achievements.

Pillai (1987) proved that socio-economic status of parents is directly related to underachievement.

Pollan (1987) explored the cause of under achievement in mother tongue of secondary school students and found that

socio-economic status is an important factor for under-achievement in Malayalam.

George (1989) measured the relationship between socio-economic status and achievements in Hindi of Secondary schools and found that there is correlation between socio-economic status of parents and achievements.

Reddy (1989) measured the impact of socio-economic status and parental education on language development of children and found that children coming from families of high socio-economic status had better language development.

3.2.3 Sex and Locality of residence

Pattel (1960) measured the relationship of caste, rural-urban habitation, education of the guardian and the education of the parents to the performance of children in Kaira district. He realised that all these variables had significant relationship with the academic performance of children.

Saxena (1960) and Rup Prakash (1968) have found that there is correlation between achievement in Science and the location of School where they study. Pupils in urban areas scored more in science than those in rural areas.

Nair (1968) found significant sex difference favouring

boys for different levels of academic performance.

Bergland (1971) proved that sex differences existed in the achievement in Mathematics of high school children.

Mathew (1974) did not find any significant difference between boys and girls in intelligence and science achievements.

Nair (1975) found that girls in general scored higher than boys in Science achievement.

Sara Williams (1979) compared the achievements of the Rural and the Urban Secondary School pupils in General Science, in Kanya Kumari district, and understood that the difference in the achievement scores of the two groups is significant. Urban school boys have a higher mean score than the rural school boys.

Seethamony (1987) showed that incidence of under achievements was higher among boys than girls in Secondary schools.

Asha Gupta and Sureksha Swain (1987) compared the personality adjustment and achievement motivation in relation to scholastic achievements of the Rural and the Urban Adolescents and found that urban children are better as compared to rural adolescents in achievements.

Pillai and Sudheeshkumar (1994) explored whether variation in achievement in Biology related to sex, locale, cognitive style and approaches in studying. The sample consists of 700 secondary school pupils in Kerala. Through the study they showed that there is significant difference between Rural-Urban students in Biology achievements. But urban group students could score high in biology examination.

3.3 Studies related to Integrated Education of the Visually Handicapped

There are few studies that have been aimed at throwing light into the problems, prospects, and other various aspects of the integrated education programmes. These are given below.

Banman (1967) explored the adjustment levels of visually handicapped students attending residential schools and integrated schools. The study was compared with a group of 150 boys and 150 girls attending residential school and integrated classes respectively. A self report personality inventory was administered to both the groups. It was found that the students attending residential schools have more problems of social and emotional adjustments than the Integrated group, especially in variables like anxiety and insecurity and in difficulties related to home and parents.

Soloman Eaglestein (1975) studied the social acceptance of high school students in an integrated school and found that the visually impaired students' scholastic achievement were average and that they were well integrated into the social frame work of their classes. However, there were evidences that, as length of exposure to the visually impaired students increased, their acceptance by the sighted class-mates decreased.

Arokkyaraj (1985) explored the mannerism exhibited by visually handicapped children of residential schools and integrated schools and found that the visually handicapped children in the integrated systems are able to minimise the mannerisms and that the early interaction with the sighted help them to correct their bad mannerism from the beginning.

Darling (1985) studied the difficulties encountered by the teachers in teaching mathematics to visually handicapped children in regular class rooms and found that the regular classroom teachers are capable of teaching Mathematics to visually handicapped children. But at the primary level the service and co-operation of the resource teachers are highly essential. The regular teachers, shall also be partner to resource teachers in preparing aids for visually handicapped.

But the fact is that the Resource teacher must be well versed in Mathematics so as to make the subjects ease.

Anandan (1986) studied the effect of integration on social skills of the sighted and the visually disabled children and found that, not only visually impaired children but sighted are also benefited from integrated education. Both visually impaired and sighted are having many friends. Majority of the sighted are found helpful to the visually handicapped in their studies and most of the visually handicapped participate in the school cultural programmes and showed readiness even to take part excursion programmes of the school.

Alvin Sathyanesan (1986) compared the achievement of visually handicapped children in curricular and plus curricular activities and found that the achievement of visually handicapped children of integrated education could serve more than that of the children in the residential schools. In braille writing, mathematical devices, orientation and mobility are well expertised more by the integrated than by the residential system. Residential children are almost equal to the integrated children in their daily living skills. But in the case of concept

development, map reading etc., the integrated students are superior.

Venkatesan (1987) held a study to find out the views of the teachers of visually disabled children towards the National Policy on Education (1986) and its programmes of action on education of the handicapped. He understood that majority of the teachers are of the opinion that universalisation of primary education is possible for the visually disabled children, only when integrated system expands. He suggested that prime importance has to be given to the training of teachers in the integrated system and more attention should be given to the production of required materials in the braille system of imparting instruction to visually handicapped.

Alagesan (1987) conducted a study of the resource teachers' responsibilities in Integrated Education Programmes for the visually impaired children in Tamilnadu and identified the duties and functions of the resource teachers for the success of integrated education systems. The success of integrated education programmes depend upon the co-operation and co-ordination of regular and resource teachers. Right attitude of the resource teachers always provide a very healthy atmosphere conducive to the normal growth of an

individual.

Krishna Murthi (1987) conducted a comparative study of the early integration and later integration of visually disabled children and their educational and sociological implications and found that the academic performance of the children of early integration is better than that of the children of later integration.

James Q. Affleck (1988) compared the achievement data of the visually handicapped in the integrated classroom model (ICM) to that of resource room programmes and found that integrated students were significantly higher than that of the resource students. In the case of Mathematics the students in the resource room were found more successful. The integrated classroom model was less expensive.

Nirmala Devi (1988) studied the attitude of regular teachers towards integrated education programme for visually impaired children in three districts of Andhra Pradesh and found that as teaching experience increases, attitude of the teachers also changes in a more positive direction.

Ebanezer (1988) held a comprehensive study on the difficulties encountered by the low vision children in the Integrated Education Programmes and in the school for the

blind and found that the performance of the low vision children in the integrated schools is better than that of the low vision children in the school exclusive for the blind.

Vaithialingam, (1988) measured the attitude of visually handicapped children towards sighted children and found that the visually handicapped children of integrated schools have better attitude towards sighted children than those in the residential schools. Among this, the male children shows more positive attitude. As experience increases the sighted children have influenced more in the attitude of visually handicapped.

Hipsibah Let Grace (1988) conducted a study on the role of society in Integrated education programmes for visually disabled children in Tamil Nadu and Andhrapradesh and found that the role of sighted towards visually disabled children is positive. The regular teachers, resource teachers, administrators and parents play vital role for the successful implementation of integrated education programmes.

Narayana Swamy. (1989) in his study on the efficiency of the supplementary instructional materials in History and

Geography for the primary level visually disabled children in the integrated education programmes and came to the conclusion that there is considerable significant difference between the means of the two groups. The achievement scores of boys are higher than that of the girls and found that age is an important factor in achieving higher scores.

Ganapathy (1989) studied the use of teaching aids in Mathematics for visually handicapped children of Standards VI, VII and VIII in Integrated Education Programmes and proved that effective teaching is possible only by using teaching aids especially in certain areas like Angles, Triangles, Statistical graphs, Mensuration and Algebra. He also identified scrap materials to prepare mathematical aids to the teaching of visually disabled children.

Philip (1990) measured the level of academic achievement of visually disabled children of Integrated Education Programmes in Tamil Nadu. He points out that abstract subjects like Mathematics and Science too could easily be learned by the visually disabled children. According to him the system of Integrated Education is the only successful method for imparting instruction to visually disabled children.

Mythily (1992) measured the effect of Integrated

Education on Academic Achievement of Visually Handicapped children in History and Geography of VI to X Standard classes and found that the visually handicapped children have several social psychological and biological needs to be satisfied for the development of personality leading to a healthy and happy social life.

Murugesan (1993) tried to understand the job satisfactions of Resource teachers of visually impaired children in Integrated Education Programme in Tamilnadu and found that the programme achieved its primary goals. The resource teachers are fully satisfied with the programmes and are willing to admit other disabled children also with visually impaired children in the present setting of integrated education programmes. They opined that they would come forward to expand the Integrated Education Programme provided sufficient financial support from the Government.

CONCLUSION

The review of surveys shows that the Integrated Education Programmes organized for the visually handicapped is still in the initial stage and is facing many problems to be scientifically tackled with. Empirical studies are quite few in number and many problem areas are not yet to be touched. Even regarding the crucial issues of enhancing

scholastic performance of disadvantaged group, the studies are very ~~scarce~~ and the ones available are not comprehensive. Hence this survey justifies the investigator's attempt to take up such a research study.

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CHAPTER - III

METHODOLOGY

THE VARIABLES -- TOOLS USED FOR DATA COLLECTION
-- SAMPLE USED FOR THE STUDY -- DATA COLLECTION
PROCEDURE, SCORING AND CONSOLIDATION OF DATA -- PROCE-
DURES USED FOR ANALYSIS OF DATA

METHODOLOGY

1 THE VARIABLES

The present study is an attempt to compare the scholastic performance of visually handicapped pupils and normal pupils of secondary schools under the Integrated System in Kerala. The study is designed with 'Achievement (Performance) in the eight curricular areas for Standards VIII, IX and X as the dependent variables, visual handicap as the independent variable and intelligence, socio-economic status, sex and locality of residence as control variables.

The details relating to the selection of variables are presented below:

1.1 Selection of Variables

Scholastic performance of the visually handicapped pupils is generally found to be lower than that of the normal pupils. The present study is aimed to find the specific areas in which the former group is having problems. An analysis of related variables other than visual handicap that might cause the low performance also was anticipated. Children are coming from different socio-economic

status and locality of residence. Further they are having different levels of intelligence. It was anticipated that these variables might influence the scholastic performance of pupils. So only by controlling these variables, it can be understood whether there is any real difference in the scholastic performance of visually handicapped pupils and normal pupils arising out of the handicap being studied.

This has been the logic based upon which the variables in the study were selected. The variables thus identified have been listed below:

1.2 Independent variable

Visual handicap (blindness) has been considered as the independent variable.

1.3 Dependent variables

What is aimed at by the study is to ascertain whether visual handicap results in discrepancy in achievement. As such, achievement in eight curricular areas for Standards VIII, IX and X have been taken as the dependent variables for the study. The nine different measures concerning school achievement thus selected are given below:

- 1) Achievement in Malayalam
- 2) Achievement in English

- 3) Achievement in Hindi
- 4) Achievement in Social Studies
- 5) Achievement in Physics
- 6) Achievement in Chemistry
- 7) Achievement in Biology
- 8) Achievement in Mathematics
- 9) Total achievement in the school subjects taken together.

1.4 Control variables

To decide whether the visual handicap affects achievements, other relevant variables that are considered to affect achievement have to be controlled. With this end in view, the following variables were controlled for obtaining equated groups.

- 1) Intelligence
- 2) Socio-Economic Status
- 3) Sex
- 4) Locality of residence.

Age was not selected as a control variable because the sample will not show extreme difference in age, as pupils studying in the same standards will normally be of almost the same age.

All these tests have been prepared and standardised using a common procedure. Each test includes the area containing the portion set apart for the first terminal examination in the respective subject and standard. The investigator, in consultation with experts, decided to include 30 objective type questions in each test for each standard, all of which are multiple choice items. A common procedure was followed for the preparation of the 24 tests.

Standardisation of a good achievement test involves various steps such as planning of the test, preparation of the test, try out of the test, item analysis and finalisation of the test. While planning the test, a design was developed taking into consideration weightages to content, objectives, type of items and level of item difficulty.

The objectives to be considered in these tests have been adopted from the guidelines given to teachers by the State Institute of Education, Kerala. As regards the objectives, the six levels of cognition described by Bloom and his associates (1956) are knowledge, comprehension, application, analysis, synthesis and evaluation. Of these only the first three levels viz., Knowledge, Understanding/Comprehension, and Application have been accepted in Indian

schools in general. The guidelines of the State Institute of Education, mentioned above too have suggested only these three objectives. Hence the investigator has ~~included~~ only knowledge, comprehension and application, as the major learning outcomes for all the tests in the three parts. Because the visually handicapped pupils are not expected to draw pictures, questions calling for skills have been omitted.

With the three objectives in mind, the investigator analysed the whole content to be covered by the tests and an out line for the weightage to content was prepared for every one of the 24 tests.

As already indicated, only multiple choice items have been included. Each item has been given four choices out of which the correct response has to be found out.

As regards the weightage given to difficulty level, fifty per cent of items are of average difficulty, 25 per cent are easy items and the remaining 25 per cent are difficult items.

As the content covers only portions taught upto the first terminal examination and pupils have to answer tests in eight curricular areas, it was decided to have 30 items in the final form of each of the 24 tests. ~~Fifteen~~ minutes

was allotted for answering each test.

While preparing the designs for the weightages to the objectives and content, consultation was made with experts in the field of education. A blue print specifying the content covered by the test in relation to the weightages assigned for different objectives and content areas also was prepared.

On the basis of these blue prints for the final test, the investigator initially prepared 60 multiple choice items for each test so that the sufficient number of acceptable items could be made available at the end. The items thus prepared have been scrutinised by a team of evaluation experts and subject specialists; The items were re-edited, and necessary changes made in the light of their suggestions. Consequently a final draft consisting of 50 items was prepared as preliminary test for each subject for each standard. These items were arranged according to the various objectives viz., Knowledge, Comprehension, and Application. The knowledge items have been included in the beginning and those of the higher objectives arranged at the end.

Each preliminary test was then tried out to a small group of 20 pupils consisting of 10 girls and 10 boys in the standard concerned. These were conducted at the

Vocational Higher Secondary School, Cheruvannoor. On the basis of the feedback, ambiguity in the direction, etc., were got corrected and the final forms of the preliminary tests were got ready.

This was followed by the try out. The tests were administered to a sample of 429 pupils of Standard VIII, 427 pupils of Standard IX and 421 pupils of Standard X, selected randomly from four schools of three revenue districts of Kerala, viz., Trivandrum, Kollam and Malappuram. Schools were selected according to SSLC results as high, average and below average (Above 65 per cent as high, between 35 per cent and 65 per cent as average and below 35 per cent as below average respectively). Equal representation was given to boys and girls, and rural and urban population. All the tests were administered during the third week of August, 1993.

The scripts of the preliminary test, complete in all respects were scored using the same scoring procedure. For item analysis, the response sheets of 370 subjects were selected by systematic random procedure. On the basis of the scores these sheets were classified. The upper group consisting of the 100 (27 per cent of total group) who received the highest scores and the lower group of 100 who received lowest scores, were separated. Then the difficulty level and the discriminating index were determined, using

the following formulae:

$$\text{Index of item difficulty} = \frac{U + L}{2 N} \times 100$$

$$\text{Index of discrimination} = \frac{U - L}{N} \times 100$$

Where,

U = No.of correct responses in the upper group

L = No.of correct responses in the lower group

N = No.of papers in upper or lower group.

Items with difficulty value between 0.4 and 0.65 and with a discriminating power 0.35 and above were readily selected. A total number of 30 items thus selected were included in the final test in accordance with the design and blue print. Copies of the final tests along with the response sheet are given as Appendix 1 to 25.

Reliability and Validity of the Achievement Tests

The reliability coefficients of the tests in the eight curricular areas for standardsVIII, IX and X were established, using the split half method. This was done on a representative sample of 50 subjects each. First the test was divided into two halves (one half consisting of all the odd numbered items and the other half consisting of all the even numbered items) and the scores of the two half

tests were correlated applying Karl Pearson's Product Moment Technique. From the reliability of the half test, the coefficient of correlation of the whole tests were found out by Spearman-Brown Formula viz.,

$$r_{xx} = \frac{2r_{hh}}{1 + r_{hh}} \quad (\text{Fergosen, 1976})$$

Where r_{xx} = the reliability of the whole test

r_{hh} = the reliability of the half test.

The split half reliability of the achievement tests in the eight curricular areas for Standards VIII, IX and X are separately given below:

TABLE 1
 Details regarding Split-Half Reliability
 of the Achievement Tests

Tests	Split-Half Reliability Coefficient		
	Standard VIII	Standard IX	Standard X
Malayalam	.69	.71	.71
English	.64	.67	.73
Hindi	.68	.72	.69
Social Studies	.75	.69	.72
Physics	.66	.68	.65
Chemistry	.76	.74	.75
Biology	.77	.76	.73
Mathematics	.64	.63	.65

The content validity of the test had been already ensured by giving weightages to content and instructional objectives. Statistical validity of the tests were determined by correlating the test scores with that of an external criterion, viz., marks obtained by students in the school. This was calculated for a sample of 60. The validity coefficients of the achievement tests in the

eight curricular areas for Standards VIII, IX and X thus obtained are reported below:

TABLE 2

Details of the correlation coefficients
indicating validity of the
Achievement tests

Tests	Validity coefficient (with class marks as external criterion)		
	Standard VIII	Standard IX	Standard X
Malayalam	.66	.64	.70
English	.61	.60	.64
Hindi	.59	.61	.67
Social Studies	.56	.58	.60
Physics	.55	.57	.54
Chemistry	.68	.66	.68
Biology	.67	.63	.65
Mathematics	.59	.58	.60

The details of these tables indicate that the 24 achievement tests are valid and reliable.

2 TOOLS USED FOR DATA COLLECTION

The nature of the study dictated the use of three kinds of measuring instruments viz., a) tools for measuring scholastic performance; these include achievement tests in eight curricular areas for Standards VIII, IX and X, (b) tools for measuring two of the control variables in the study, for which the tools listed below were used:

1. The Kerala University Group Test of Intelligence (Verbal)
2. The Kerala Socio-Economic Status Scale.

Brief description of these measuring tools are presented below:

2.1 Achievement Tests in the eight curricular areas for Standards VIII, IX and X

The achievement tests have been prepared by the investigator with guidance and help from experts in the fields. One test each was developed on every subject for each standard. The subjects included in the study are the eight school subjects viz., Malayalam, English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics. Thus 8×3 (24) achievement tests have been developed and administered.

2.2 Kerala University Group Test of Intelligence (Verbal)

This test has been developed by Pillai, Nair and Amma (1968). This is a point scale of intelligence in Malayalam developed for measuring the general intelligence 'g' of secondary school pupils of Kerala. The scale consists of five sub-tests, viz., Verbal Analogy, Verbal Classification, Proverbs, Number Series and Verbal Reasoning. The details regarding the sub tests are given in Table 3.

TABLE 3

Sub-tests of Kerala University Group
Test of Intelligence (Verbal)

Sub tests	No. of items	Time limit
1. Verbal Analogy	20	6 minutes
2. Verbal Classification	20	5 "
3. Proverbs	20	8 "
4. Number series	20	6 "
5. Verbal reasoning	20	10 "

The nature of each sub-test is described below:

(i) Verbal Analogy

In each item, two pairs of items are given in such a way that the relation connecting the first pair agrees with that of the second pair also. Of these four words, one pair is given fully, whereas one word in the other pair is left out. The respondents have to find out the relation between the first two words and to apply the same on the third word given and identify the word left out.

The test contain 20 items, with six minutes to answer.

Example:

Ice : Water :: Water :: _____

(a) Water. (b) Fire (c) Vapour (d) heat.

Various factor analytic studies have shown that this test involves a reasoning factor indicated by the ability to identify Relationships.

2. Verbal Classification

In every item of the test, five words are given. Of which four can be grouped together as per certain principles. The pupil has to identify the word that stands out from group. The test includes 20 such items and the time allotted is five minutes.

Example:

- a) Centimeter (b) Millimeter c) Meter d) Gram
 e) Kilometer.

The mental process involved in answering questions of this types is more or less the same as that of the previous test, viz., identifying relationships.

3. Proverbs

Every item of the test contains a proverb and four statements explaining its meaning. The pupil has to choose the statement which is very close to the idea of the proverb. The test contains 20 items and the time allotted to complete is 7 minutes.

Example:

- 1) Slow and steady win the race.
- a) If we eat slowly we can eat a large amount of of food.
- b) If we work systematically we can perform difficult task also.
- c) Any work should be done slowly.
- d) Any work which is done slowly is good.

Test of this types are said to be saturated with 'g' factor of intelligence. The mental ability of the pupils in this case is termed as 'Verbal Comprehension Factor.'

4. Number Series

Every item of the test consists of a series of numbers arranged in a certain order, out of which one is missing. The pupil is to choose the missing number from those given in brackets. The test has 20 items and the time limit is 6 minutes.

Example:

120, 60, 30, 15, $7\frac{1}{2}$, _____

(a) 8; (b) $3\frac{3}{4}$ (c) $1\frac{7}{8}$.

Thurston termed the mental ability involved in terms of this kind as 'inductive reasoning.'

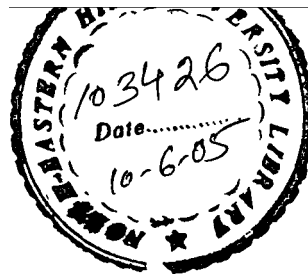
5. Verbal Reasoning

Every item is a question requiring the perception of certain relationship and its identification. The subject is required to select the correct answer to the problem from the four alternatives given:

Example:

- 1) A is taller than B, but shorter than C. C and D are of the same height. Who is the shortest among them? (a) A (b) B (c) C (d) D.

Thurston calls the mental ability involved in answering items of this type, 'deductive reasoning.'



Validity and Reliability

Validity of the test was determined by adopting components from other tests of proved merit and partly by ensuring high internal validity attained through item analysis. The inter-test correlation of the sub-tests has been worked out on a select representative sample (N = 120). The inter-test correlations of the five tests in the battery are given in Table 4.

TABLE 4
Inter-test correlations of the Kerala
University Group Test of Intelligence (Verbal)

sub-tests	1	2	3	4	5
1) Verbal Analogy	.	.75	.66	.45	.56
2) Verbal Classification	.	.	.63	.47	.41
3) Proverbs47	.41
4) Number series32
5) Verbal Reasoning

The validity coefficients of sub-tests 1 to 5 assessed by comparing with total school marks (external criterion) were 0.61, 0.53, 0.65, 0.67 and 0.45 respectively (N= 50).

With Ravens' Progressive Matrices Test as the external criterion, the validity coefficient of the whole (total scores in the five tests) was found to be 0.56 (N = 120).

The fundamental validity of the test has been assessed by Kurup (1969). It was found that 79 per cent of the common variance of the battery is accounted for by the 'g' factor of intelligence.

The split half reliability (N = 120) corrected for shortening, using Spearman-Brown Formula is given in Table 5.

TABLE 5
Reliability Coefficients of the Kerala University
Group Test of Intelligence (Verbal)

Sub Tests	Split half reliability coefficients (N = 120)
1) Verbal Analogy	0.88
2) Verbal Classification	0.86
3) Proverbs	0.86
4) Number Series	0.86
5) Verbal Reasoning	0.84
6) Whole Test	0.93

The test-retest reliability assessed on a sample of 86 was 0.79, the interval between the test and re-test being one month.

2.3 Kerala Socio-Economic Status Scale (Revised Version)

In the present study, the Kerala Socio-Economic Status Scale developed by Nair (1978) was used with slight modification. The scoring scheme suggested for income was revised to catch up with rising cost of living, as income increases.

The Socio-Economic Status Scale was used to measure three dimensions of Socio-Economic Status, viz., Education, Occupation and income level of the head of the family. Each variable in the scale has been divided into categories on the basis of the discussions held with experts in the field and suggestions given by them.

The data for the scale has been obtained from the 'General Data Sheet' administered on the sample. It has been divided into three parts. Part I highlights the general information about the subject regarding the name of the pupil, sex, age, caste and religion, number of elder siblings, number of younger siblings, locality of the school, etc. The second part is given with a view to obtain information regarding level of education, occupation and income of parents and siblings. The third part is intended to gather information regarding scholastic achievement in various school subjects in the form of marks/scores. Here

the investigator herself recorded the marks from the school records.

The information collected through the first part of the General Data Sheet has facilitated in classifying students sex-wise and locale-wise. The information gathered from the second part of the general data sheet has been used to ensure the educational level, occupational level and income level of father, mother and siblings. This information has been used to measure the socio-economic status of the pupils.

A copy of the General Data Sheet is given as Appendix 26.

Details regarding the scoring scheme of the Kerala Socio-Economic Status Scale is presented in Table 6.

TABLE 6

Table showing the categories and the respective weightages of the components of the Kerala Socio-Economic Status Scale

Variables	Categories	weightages
1. Parental Educational Level	1. Illiterate	5
	2. Standards I to IV	10
	3. Standards V to VII	15
	4. Standards VIII to X	20
	5. Pre-University/Pre-Degree T.T.C/Intermediate	25
	6. B, A/B.Sc./B.Com/Engg. Diploma etc	30
	7. M, A/M.Sc./M.B.B.S./M.Ed./B.Sc. (Engg.)/B.Sc. (Tech)/LL.B	35
2. Parental occupation	1. Unemployed	5
	2. Unskilled	10
	3. Semi-skilled	15
	4. Skilled	20
	5. Semi-professional	25
	6. High professional	30
3. Parental Income Level (Monthly)	1. Below Rs.450/-	5
	2. Rs.451-1000/-	10
	3. Rs.1001-2000/-	15
	4. Rs.2001-3000/-	20
	5. Rs.3001-4000/-	25
	6. Rs.4001-5000/-	30
	7. Above Rs.5000/-	35

Parental Occupation Level

This has been classified into six categories. These are as follows:

(i) Unemployed

Those who are not in regular employment. The weightage assigned to this category is five.

(ii) Unskilled

Coolies, Ordinary Labourers, Watchman, Peon, etc. form the unskilled labourers. Ten points is assigned to this group.

(iii) Semi-skilled

Farmers, small scale merchants, library attenders police constables etc., belong to this category and they are assigned 15 points.

(iv) Skilled

Merchants, fitters, electricians drivers, photographers, laboratory assistant, carpenters, document workers, vakil clerks, head constables, village officers and the like fall under this category and they are assigned 20 points.

(v) Semi-Professional

Chemist, druggists, qualified nurses, teachers,

managers, Superintendent of officers, minor business men, contractors, small landlords, sub-inspectors of police, sub-registrars, educational officers, block development officers, officers having jurisdiction at the sub-district level, public health workers or equivalent etc. fall under this category and they are assigned 25 points.

(vi) High professional

Ministers, judges, bank executives and officials, doctors, engineers, lawyers, university teachers, heads of research organisations, heads of government departments, secretaries to government big land lords, business executives and equivalent sections belong to this category and 30 points are allotted to this category.

Separate scores have been obtained for the three components and the total score of the three components with respect to the father i.e., score on educational level, occupational level, and income level taken together has been considered as the score for socio-economic status of an individual. Summated score for mother's educational, occupational and income level has been taken for pupils whose father is either dead or has left the family.

3 SAMPLE USED FOR THE STUDY

The population used for the present study are pupils studying in various secondary schools under the integrated system in Kerala. Based on this, the investigator has taken certain decisions in sample selection. The factors listed below were considered while selecting the sample.

- 1) Size of the sample
- 2) Techniques of sampling

These are explained below in detail.

3.1 Size of the sample

The investigator, as mentioned in an earlier context, has aimed to compare the scholastic performance of visually handicapped pupils and normal pupils of secondary schools in the eight curricular areas. Two types of samples are then warranted - first, a sample of the visually handicapped pupils and next a sample of the population of normal pupils. The procedure adopted for the selection of the two types of samples is given below.

Sample of visually handicapped pupils

There are only 10 schools in Kerala under the integrated system of visually handicapped pupils. In selecting the size of the sample, the investigator has first identified

the visually handicapped pupils under this system. It has been found that the blind pupils studying in those schools are only very few in number. To get a sample large enough for the study, the investigator had to select pupils studying in all the three levels of secondary school viz., Standards VIII, IX and X. Out of the ten integrated schools in Kerala, eight schools have been included in the present study for drawing the sample of visually handicapped pupils. Two of the schools had to be left out because of the non-co-operation of the management. The numbers of visually handicapped pupils in the schools selected were small and hence all of them were included in the sample. Thus the sample happen to be the population itself of the visually handicapped pupils of the eight schools.

Sample of normal pupils

A sample of normal pupils also was drawn from the same class divisions from which the visually handicapped pupils were selected. This was considered necessary to ensure that the two groups get the same exposure to curricular and co-curricular experiences.

3.2 Technique of sampling

The investigator had to compare in the study large

unselected samples of the visually handicapped pupils and normal pupils and also large matched groups as well as small matched groups formed by equating intelligence, socio-economic status, sex and residence, one or more at a time. Equating one variable, in itself, would drastically reduce the size of the original sample in each of the compared groups. Hence naturally equating more than one variable would bring about a more drastic reduction in the sample size of the two groups. Hence the original sample had to be large enough to make provision for such restrictions, and to yield final samples which can be treated as statistically large. Statistically large samples are those of size 30 or more. But the visually handicapped pupils have been fewer in number. Hence it was thought that their size may be kept constant, while making equated groups for the three standards VIII, IX and X. For every visually handicapped pupil eight normal pupils have been selected from the same class division while deciding the total sample of normal pupils. To obtain a representative sample of these normal pupils, due representation has been given to sex and the locality of the institution. It was intended to make it possible to get the smallest sample size of 30 and above from each of the three standards. But there are only 22 visually

handicapped pupils in Standard X in all the schools taken together. Hence only small sample could be considered for Standard X. Anyhow to match with the 95 visually handicapped pupils, the investigator has selected 760 normal pupils. The sample of the visually handicapped pupils and normal pupils from Standards VIII, IX and X are given in Table 7.

TABLE 7

The total sample drawn from the two groups of Visually Handicapped and Normal Pupils

Class	Visually Handicapped pupils	Normal pupils
Standard VIII	41	328
Standard IX	32	256
Standard X	22	176
Total	95	760

TABLE 8

List of Schools selected for the Study

Name of school	District	Location	Sex
1. Govt. High School Mankada	Palakkad	Rural	Mixed
2. K.H.S. Thottara	Palakkad	Rural	Mixed
3. Govt. Vocational High School, Cheruvannoore	Kozhikode	Rural	Mixed
4. Govt. Model Boys High School, Kunnamkulam	Thrissur	Urban	Boys
5. Govt. High School, Kuttamassery	Eranakulam	Rural	Mixed
6. Govt. High School, Kudamaloore	Kottayam	Rural	Mixed
7. Cotton Hill Girls High School	Thiruvananthapuram	Urban	Girls
8. S.M.V. High School	Thiruvananthapuram	Urban	Boys

4 DATA COLLECTION PROCEDURE/SCORING AND CONSOLIDATION OF DATA

The investigator prepared the test booklets and answer sheets in the final form. For the present study 24 achievement

tests had to be administered in addition to the intelligent test and a general data sheet.

The programme for testing was arranged after visiting the selected schools. The investigator met the heads of the schools and the class teachers and made discussion with them. A schedule was then fixed for testing. In certain schools, the auditorium and in some other schools, a large sized classroom was specially arranged, so that the pupils could take the test conveniently.

Administration of all the tools took more than two hours. The investigator personally administered the tests to all pupils with the help of the class teachers concerned. Administration was done under the same examination conditions. Scribes who were well trained for the purpose by the investigator helped the visually handicapped pupils to answer. The intelligence test was converted into braille language for the visually handicapped pupils, so that they could answer the test themselves. In the case of the achievement tests, the items were read to them clearly and the answers elicited and recorded.

The administration of all the tests started in the beginning of September 1993 and was completed by the end of October 1993.

5 SCORING AND CONSOLIDATION OF DATA

Scoring of the answer sheets has been done in the lines of the directions given in the respective test manuals. Punched scoring keys have been used to expedite scoring of intelligence test and the 24 achievement tests. Incomplete data sheets have been discarded. Finally, cases which had been completed in all respects were chosen for the final analysis. Thus the final sample of normal pupils was reduced to 640.

The scores and other data relating to the samples were tabulated and consolidated in data sheets. The total sample was classified according to the pre-designed categories, boys/girls and rural/urban. The data were entered in such a way that they would be used for computer data processing. Break up of the final sample used for analysis is presented in tables 9, 10 and 11.

TABLE 9

Break-up of the Final Sample drawn from Visually
Handicapped Pupils and Normal Pupils of
Standard VIII classified on the
basis of sex and residence

Residence of subject	Groups compared					
	Visually handicapped pupils			Normal pupils		
	Boys	Girls	Total	Boys	Girls	Total
Rural	17	16	33	110	100	210
Urban	7	1	8	44	12	56
Total	24	17	41	154	112	266

TABLE 10

Break-up of the final sample drawn from Visually
Handicapped Pupils and Normal Pupils of
Standard IX classified on the
basis of sex and residence

Residence of subjects	Groups compared					
	Visually handicapped pupils			Normal pupils		
	Boys	Girls	Total	Boys	Girls	Total
Rural	12	9	21	82	64	146
Urban	10	1	11	65	8	73
Total	22	10	32	147	72	219

TABLE 11

Break up of the final sample drawn from Visually Handicapped pupils and normal pupils of Standard X classified on the basis of sex and residence

Residence of subject	Groups compared					
	Visually Handicapped pupils			Normal pupils		
	Boys	Girls	Total	Boys	Girls	Total
Rural	9	8	17	66	54	120
Urban	3	2	5	21	14	35
Total	12	10	22	87	68	155

6 PROCEDURES USED FOR ANALYSIS OF DATA

6.1 Classificatory techniques

(a) Procedure for obtaining equated groups from Standards VIII IX and X

The two samples (of the visually handicapped pupils and normal pupils) had to be equated for the different control variables. For obtaining the equated groups, the matching was done in pairs so that each pupil in the first group has a paired equivalent in the second group. The paired equivalent

was identified with respect to one or more variables at a time. First in order to set off the effects of intelligence, two equated groups of visually handicapped pupils and normal pupils were identified from the total sample by matching each visually handicapped with a normal pupil of almost the same level of intelligence. A difference of upto 2 scores in intelligence was ignored. The process of searching for equated pairs was continued till for each subject from the group of visually handicapped pupils, it was not possible to locate another subject of equal or near equal intelligence in the group of normal pupils. This has been the process of making equated pairs for Standards VIII, IX and X.

Thus from the total final sample of 155 normal pupils of Standard X, the maximum number of normal pupils whose intelligence scores could be equated with each of the visually handicapped pupils were selected. This group of normal pupils has been called the 'A₁' group in further discussion. From the 'A₁' group 22 normal pupils were selected for the 22 visually handicapped pupils of Standard X for the purpose of comparing achievements during the first stage, that is by controlling IQ alone. This group has been designated as 'a₁' Group.

At the second stage, from the total final sample of the 155 normal pupils of Standard X, the maximum number of normal pupils whose socio-economic status scores alone could be equated with each of the visually handicapped pupils were selected. A difference of upto two scores in Socio-economic Status was overlooked in identifying matched pairs. This group of normal pupils has been called the 'A₂' group in further discussion. From the 'A₂' group 22 normal pupils were selected for the 22 visually handicapped pupils of standard X for the purpose of comparing achievements during the second stage, that is by controlling socio-economic status alone. This group has been designated as "a₂' group.

In the third stage onwards, more than one variable was controlled at the same time. From the 'A₁' group that is the normal pupil group got by controlling IQ alone, matching was again made on the basis of socio-economic status too. From the 'A₁' group (that is normal pupils whose intelligence has already been controlled) the maximum number of cases that could be matched with the 22 visually handicapped pupils for socio-economic status also were identified. This group of normal pupils who could be equated both for intelligence and socio-economic status has been designated as 'A₃' group in further discussion. From the 'A₃' group 22

normal pupils were equated with the 22 visually handicapped pupils with respect to socio-economic status also. This in effect yielded equated groups of visually handicapped pupils and normal pupils controlled for both intelligence and socio-economic status. The equated groups obtained in this manner were used for comparison at the third stage. This group has been designated as 'a₃' group.

At the fourth stage matched pairs were obtained from the 'A₃' group, that is the group of normal pupils, where IQ and socio-economic status were equated with the visually handicapped by controlling sex also. Here also for each of the visually handicapped pupils in the two sex group, maximum number of normal pupils of the same sex were selected from the 'A₃' group until further matching was not possible. Thus in effect yielded equated groups of visually handicapped pupils and normal pupils controlled for intelligence, socio-economic status and sex at the same time. This group has been designated as the 'A₄' group. From the 'A₄' group 12 boys and 10 girls were separated to get matched with the 12 boys and 10 girls respectively of the visually handicapped pupils of Standard X. This equated groups were compared at the fourth stage. This group has been designated as 'a₄' group.

At the fifth stage matched pairs were obtained from the 'A₄' group (that is the group of normal pupils equated for IQ, socio-economic status and sex) by controlling residence also. Here also for each of the visually handicapped pupils in the two residence areas (9 rural boys - 8 rural girls and 3 urban boys - 2 urban girls) equated pairs of the same locality of residence was selected from the normal group. This in effect yielded equated groups of visually handicapped pupils and normal pupils controlled for intelligence, socio-economic status, sex and locality of residence. These equated groups were compared at the fifth state. These have been designated as a₅ group. Because of the very meagre number of visually handicapped pupils (3 boys and 2 girls) in the urban school, their comparison with the normal pupils could not be done in the analysis.

Thus the equated groups for Standard X were determined. The same procedure was used for getting the equated groups for Standards VIII and IX also.

- (b) Procedure for obtaining equated groups of visually handicapped pupils and normal pupils for comparing the levels of cognition

The correlated groups of visually handicapped pupils and normal pupils controlled for IQ and socio-economic status

from the three standards were taken separately for comparing their levels of cognitive domain (K,U,A) between the two groups. Since intelligence and Socio-economic status are the two major factors which influence the achievement of pupils, this equated group (controlling IQ and SES) was taken by the investigator for comparing their levels of cognition. In every Standard (VIII, IX and X) the eight curricular areas of the two groups were taken for comparing the performance of the two groups in the three levels of the cognitive domain. The data were entered in such a way that they would be used for computer data processing.

6.2 Statistical techniques used for analysis of data

The present study is an attempt to compare the scholastic performance of visually handicapped pupils and normal pupils under the integrated system in secondary schools. The objectives of the study and the specific hypotheses to be tested warranted the use of the following statistical techniques.

- i) Test of significance of difference between the means of large independent samples.
- ii) Test of significance of difference between the means of small independent samples.

- iii) Test of significance of difference between correlated means of large samples.
- iv) Test of significance of difference between correlated means of small samples.

These techniques are described below:

6.2.1 Test of significance of difference between means of large independent groups (Guilford 1973).

The technique was used to compare the scholastic performance of the unmatched groups of visually handicapped pupils and the normal pupils of Standards VIII, IX and X. The difference in the mean scores was tested for significance by finding out the critical ratios using the formula,

$$C.R = \frac{M_1 - M_2}{SE (M_1 - M_2)} \quad \text{in which}$$

$$SE (M_1 - M_2) = \sqrt{\frac{\sigma_1^2}{N_1} + \frac{\sigma_2^2}{N_2}}$$

M_1 and M_2 are the means of the two groups compared, σ_1 and σ_2 are the standard deviations of these groups, and N_1 and N_2 sizes of the two groups.

The difference between the mean score is considered to be significant at 0.05 level or at 0.01 level, depending upon whether the obtained critical ratio (i.e., the t-value) exceed ± 1.96 or ± 2.58 respectively.

5.2.2 Test of significance of difference between means of small independent groups (Garrett, 1981)

This technique was used to compare the scholastic performance of the unmatched groups of visually handicapped pupils and normal pupils of Standard X, as the number of visually handicapped pupils was only 22. The difference in the mean score was tested for significance by finding out the critical ratio using the formula,

$$C.R. = \frac{M_1 - M_2}{SE_D}$$

$$SE_D = SD \sqrt{\frac{N_1 + N_2}{N_1 N_2}}$$

$$SD = \sqrt{\frac{\sum (X_1 - M_1)^2 + \sum (X_2 - M_2)^2}{(N_1 - 1) + (N_2 - 1)}}$$

$\sum (X_1 - M_1)^2$ is the sum of the square deviations around the mean of group I and $\sum (X_2 - M_2)^2$ is the sum of the

square deviation around the mean of group 2. N_1 and N_2 size of the two groups, SE_D is the Standard Error (SE) of the difference between means in small independent samples.

6.2.3 Test of significance of difference between two correlated means (when the samples are large) (Garret, 1981)

This technique was used when the equated groups of visually handicapped pupils and normal pupils were compared for their means, if the numbers of both groups were above 30. Here modified forms of the 't' test (Viz., 't' test for large dependent samples) was used. This required the computation of the Pearson Product-Moment Correlation for each achievement variable, by treating the scores of the two matched pairs in each achievement variable as independent and dependent variables. The difference in the mean score was tested for significance by finding out the critical ratio using the formulae,

$$t = \frac{M_1 - M_2}{SE_D}$$

$$SE_D = \sqrt{\sigma^2_{M_1} + \sigma^2_{M_2} - 2r_{12}\sigma_{M_1}\sigma_{M_2}}$$

Where

$$r = \frac{N \left[\sum X^2 + \sum Y^2 - \sum (x - y)^2 \right] - 2 (\sum x) (\sum y)}{2 \sqrt{\left[N \sum X^2 - (\sum x)^2 \right] \left[N \sum Y^2 - (\sum y)^2 \right]}}$$

in which $\sum (x - y)^2$ is the sum of the squared difference between the two sets of scores, σ_{M_1} and σ_{M_2} are the standard errors of the means of the two groups and r_{12} is the coefficient of correlation between two groups in the test.

6.2.4 . Test of significance of difference between two correlated means when the samples are small (Garrett, 1981)

This technique was used when the equated groups of visually handicapped pupils and normal pupils were compared for their means and the number is atleast one of the groups happened to be less than 30. Here a modified form of the 't' test viz., 't' test for small dependent sample was used. The difference in the mean scores was tested for significance by finding out the critical ratio using the formulae:

$$CR = \frac{\text{Mean}_D}{SE_{MD}}$$

$$SE_{MD} = \frac{SD}{\sqrt{N}}$$

$$SD = \sqrt{\frac{\sum X^2}{N - 1}}$$

SE_{MD} = Standard error of mean difference

SD = Standard deviation

N = is the size of the group.

ANALYSIS OF DATA AND INTERPRETATION

COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE UNSELECTED GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS AND THEIR DIFFERENT EQUATED GROUPS OF STANDARDS VIII, IX AND X -- COMPARISON OF THE MEAN DIFFERENCES IN VARIOUS LEVELS OF COGNITIVE ACHIEVEMENT (K.U.A.) OF THE VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARDS VIII, IX AND X

ANALYSIS OF DATA AND INTERPRETATION

The data concerning the achievement of the Visually Handicapped pupils and Normal pupils with respect to the issues posed as objectives of the study were subjected to analysis. The objectives are restated below for ready reference. They are:

1. To test whether the two groups of Visually Handicapped and Normal pupils of Standards VIII, IX and X, differ significantly in their performance in the eight subject areas of the school curriculum as well as in their total performance.
2. To test whether the two groups of Visually Handicapped pupils and Normal pupils of Standards VIII, IX and X, obtained by equating intelligence differ significantly in their performance in the eight subject areas of the school curriculum as well as in their total performance.
3. To test whether the two groups of Visually Handicapped pupils and Normal pupils of Standards VIII, IX and X, obtained by equating socio-economic status differ significantly in their performance in the eight subject areas of the school curriculum as well as in the total performance.

4. To test whether the two groups of Visually Handicapped pupils and Normal pupils of Standards VIII, IX and X, obtained by equating both intelligence and socio-economic status differ significantly in their performance in the eight subject areas of the school curriculum as well as in their total performance.
5. To test whether the two groups of Visually Handicapped pupils and Normal Pupils of Standards VIII, IX and X obtained by equating intelligence, socio-economic status and sex differ significantly in their performance in the eight subject areas of the school curriculum as well as in their total performance.
6. To test whether the two groups of Visually Handicapped pupils and Normal pupils of Standards VIII, IX and X obtained by equating intelligence, socio-economic status, sex and residence differ significantly in their performance in the eight subject areas of the school curriculum as well as in their total performance.
7. To test whether the two groups of Visually Handicapped pupils and Normal Pupils of Standards VIII, IX and X, obtained by equating intelligence and socio-economic status differ significantly in their scholastic performance at each of the three levels of cognition viz.,

- i) acquisition of information
- ii) understanding and
- iii) the ability to apply the understanding in new situations.

With these objectives in view, each pair of groups concerned has been compared in the order with respect to their scholastic performance. The results of this comparison have been recorded below:

PART A

I. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE UNSELECTED GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII

The two groups of Visually Handicapped pupils and Normal pupils of Standard VIII were compared for their mean achievement scores in the different subjects, using the two tailed test of significance for large independent samples. Critical ratios indicating the difference between means were thus determined for the eight subjects of study as well as for the total performance. Using normal procedure for test of significance on the basis of critical ratios, it was examined

whether the groups compared differ significantly or not. Only two levels of significance, viz., 0.01 level or 0.05 level have been considered for the comparison.

The details of the data for the groups compared at this stage are contained in Table 12

TABLE 12

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the unselected groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII

Areas of scholastic performance	Groups Compared				C.R.
	Normal Pupils $N_1 = 266$		Visually Handicapped Pupils $N_2 = 41$		
	Mean (M_1)	S.D. (σ_1)	Mean (M_2)	S.D. (σ_2)	
Malayalam	62.05	11.18	60.10	13.20	0.89
English	43.09	24.93	35.78	8.47	3.50 **
Hindi	42.13	9.22	35.95	11.47	3.28 **
Social Studies	46.24	7.90	42.83	7.97	2.54 **
Physics	45.58	11.02	32.6	8.85	8.30 **
Chemistry	47.29	10.53	32.41	8.02	10.42 **
Biology	51.76	11.04	35.05	9.28	10.33 **
Mathematics	37.90	10.00	28.59	9.96	5.55 **
Total School Achievement	46.64	7.74	38.23	7.21	6.82 **

** significant at 0.01 level.

Comments

When the unselected groups of Visually Handicapped pupils and Normal pupils were compared for their educational performance in terms of the mean scores obtained, for the eight school subjects as well as the total performance, it has been noticed that the two groups differ significantly in eight out of the nine variables viz., English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics, and the total mean scores, the significance being beyond 0.01 level. In the case of the subject Malayalam only no significant difference is noticed. In fact, the significant difference in the total mean scores indicates that the two groups in general are different in their mean scholastic performance. Though only the two tailed test has been applied, the positive sign of the critical ratio shows that the normal group is superior to their disadvantaged counterparts in their mean achievements. This warrants special attention in the case of the Visually Handicapped pupils if their educational performance is to be brought on a par with their normal counterparts.

However no significant difference has been noticed between Visually Handicapped Pupils and Normal pupils in their mean achievement scores in Malayalam. The deviation from the general trend cannot be explained with the

available data.

Though it is generally noticed that the two groups differ, we cannot make very exact judgement about the phenomenon at this stage. The comparison attempted here will not help us to draw a final conclusion of the problem under study, for the simple reason that a number of variables other than the visual handicap also might have influenced the educational performance. For example, Intelligence, which is a major determinant of educational performance, has not been considered at this stage. In the same way, variables like socio-economic status, sex and residence of the two groups also might have influenced the total scholastic performance of the two groups.

It is because of the possibility of such variables exerting influence on the scholastic performance. It was decided to partial out the effect of such variables one to start with and more than one at the same time later so as to make the comparison more meaningful. It is expected that controlling the effects of these variables in some specific order might make the conclusions more dependable. Such an attempt has been made in the following stages of the analysis.

II. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR INTELLIGENCE

This part of the analysis has been devoted to the comparison of the groups of Visually Handicapped pupils and Normal pupils, when the role of intelligence is partialled out from the study. (The procedure of equating the groups with respect to selected variables has been described in the earlier chapter). After the process of matching by equating intelligence the size of the two groups remained 41. These equated groups were compared for their mean achievement scores applying the 't' test for large dependent samples. This required calculation of each pair of related variables to be compared, using the Pearson Product Moment technique.

The statistical indices used for the tests and the results of the tests of significance are presented in Table 13.

TABLE 13

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for Intelligence .

Areas of Scholastic performance	Groups compared				r	CR
	Normal Pupils N ₁ = 41		Visually Handicapped Pupils (N ₂ = 41)			
	Mean	S.D.	Mean	S.D.		
	(M ₁)	(σ ₁)	(M ₂)	(σ ₂)		
Malayalam	63.44	12.04	60.10	13.19	.89	3.50**
English	43.49	12.02	35.78	11.16	.34	4.98**
Hindi	42.59	7.81	32.95	11.46	.60	4.60**
Social Studies	47.63	6.72	42.83	7.68	.66	2.41 *
Physics	43.93	9.54	35.66	8.84	-.06	5.38**
Chemistry	46.73	9.16	32.41	8.00	-.73	5.74**
Biology	50.00	9.54	35.05	9.28	-.73	5.74**
Mathematics	39.44	11.46	28.59	9.99	-.22	5.17**
Total School Achievement	47.34	7.17	38.23	7.24	-.01	5.69**

** significant at 0.01 level

* significant at 0.05 level

Comments

When the effect of intelligence was controlled before comparing the Normal and Visually Handicapped pupils with respect to achievement, it has been noticed that the two groups showed significant difference in all the nine components (8 subjects and total score average). Of these in eight cases, except in the mean score of social studies, the difference is significant beyond 0.01 level. In the case of social studies the difference is at 0.05 level of significance (CR = 2.71 at 0.01 level and 2.02 at 0.05 level for N = 41).

From this we can conclude that there exists a real difference between the Visually Handicapped pupils and Normal pupils in their performance in the eight subject areas of the school curriculum as well as in their total performance, even when their intelligence is controlled. The +ve sign of the CR shows that the normal group is superior to their disadvantageous counterparts in their mean achievements. This again substantiates the opinion raised earlier that special attention has to be endowed upon the visually handicapped, irrespective of their intelligence, if they are to be brought on a par with the normal children. The fact that intelligence is not a

factor contributing to the difference in the achievement of the groups needs special mention.

III. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR SOCIO-ECONOMIC STATUS

In the previous part of the analysis, it was seen that equating the dominant factor namely intelligence, did not nullify the difference noticed in the mean achievement of the Visually Handicapped pupils. In this section of the analysis, an attempt has been made to form the sub-samples of Visually Handicapped pupils and Normal pupils by equating socio-economic status, another dominant intervening variable. The procedure of equating the group has already been described in Chapter III. This sub samples include 41 numbers each, as 41 numbers of the normal group having equal socio-economic status were paired with the 41 Visually Handicapped pupils. The two equated groups were then compared using 't' test for large dependent samples.

The statistical indices used for the tests and the results of the tests are given in Table 14.

TABLE 14

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for socio-economic status

Areas of Scholastic performance	Groups compared				r	CR
	Normal Pupils (N ₁ =41)		Visually Handicapped Pupils (N ₂ =41)			
	Mean (M ₁)	S.D (σ ₁)	Mean (M ₂)	SD (σ ₂)		
Malayalam	64.0	9.67	60.10	14.92	.42	1.79
English	42.61	8.00	35.78	8.45	.47	5.17 **
Hindi	42.61	7.94	35.95	11.46	.35	3.73 **
Social Studies	44.61	8.53	42.83	7.68	.45	1.34
Physics	43.12	12.29	22.66	8.84	-.21	7.90 **
Chemistry	48.40	11.33	32.41	8.00	-.63	5.96 **
Biology	50.56	12.68	35.05	9.28	-.70	4.91 **
Mathematics	37.71	11.85	28.59	9.99	-.65	2.94 **
Total School Achievement	46.70	9.09	38.23	7.24	.01	4.71 **

** significant at 0.01 level.

Comments

When socio-economic status was controlled and the mean scores of the group compared, some change from the previous reference has been noticed. The Visually Handicapped pupils and Normal pupils in their performance in the subjects, Malayalam and Social Studies showed no significant difference at 0.01 level (CR = 2.71 for N = 41). At the same time the two groups are found to differ significantly (Beyond 0.01 level) with regard to their achievements in all the other subjects and the total mean scores. The fact that the total mean scores differ significantly, for the two groups indicates that in spite of the SES being controlled, they generally show difference in the mean scholastic achievement. The +ve sign of the CR show that the normal groups are superior to their disadvantaged counterparts. Thus the present analysis in general is in tune with what was noted in the beginning.

It has been noticed that in the case of six individual subjects, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics also the two groups are significantly different in their performance when SES was controlled. This means that controlling SES could not nullify the difference between the two groups. However it has to be

noted that the difference existed in the case of Malayalam in the previous case (when IQ was controlled) has been nullified while controlling SES. The fact that in social studies achievement also, the two groups are not significantly different too needs special mention.

IV. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR BOTH INTELLIGENCE AND SOCIO-ECONOMIC STATUS

The previous sections of the analysis were intended to find out the specific roles of each of the variables intelligence and SES in causing educational differences in the scholastic performance of the groups of Visually Handicapped pupils and Normal pupils. The present section and the subsequent sections of the analysis are intended to find out as to how equating of two or more intervening variables at a time, would affect the original results.

This part of the analysis has been devoted to the comparison of the groups of Visually Handicapped pupils and Normal pupils, after partialling out intelligence and SES at the same time. After the process of matching, two equated groups of 41 pupils each were obtained. These

equated groups were then compared for their mean achievement scores, using 't' test for large dependent samples. The statistical indices used for the tests and the results of the tests of significance are given in Table 15.

TABLE 15

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for intelligence and socio-economic status

Areas of scholastic performance	Groups compared				r	CR
	Normal pupils ($N_1 = 41$)		Visually Handicapped pupils ($N_2 = 41$)			
	Mean (M_1)	SD (σ_1)	Mean (M_2)	SD (σ_2)		
Malayalam	63.22	11.53	60.10	13.19	.78	2.40 *
English	41.56	8.90	35.78	8.45	.57	4.56 **
Hindi	42.85	9.35	35.95	11.46	.51	4.22 **
Social Studies	44.93	7.36	42.83	7.94	.65	2.10
Physics	52.0	11.78	32.66	8.84	-.27	7.50 **
Chemistry	51.80	13.5	32.41	8.00	-.22	7.24 **
Biology	58.02	13.77	35.05	13.91	-.47	5.77 **
Mathematics	39.27	8.84	28.59	9.99	-.09	4.93 **
Total school achievement	49.75	8.20	38.23	7.24	-.29	5.85 **

** significant at 0.01 level

* significant at 0.05 level

Comments

When the two variables namely, intelligence and socio-economic status were controlled at the same time, it has been noticed that the two groups exhibits significant difference in six subjects out of the eight, as well as in the total mean achievement scores. The six subjects are, English, Hindi, Physics, Chemistry, Biology and Mathematics. The difference is at 0.01 level of significance ($CR = 2.71$ for $N = 41$). But in the subject Malayalam the difference has been found to be significant at 0.05 level only ($CR = 2.02$), while in the case of social studies there is no significant difference at all.

This leads to the conclusion that by partialling out the effect of major intervening variables, IQ and SES, we could not nullify the difference existing between the groups in their total mean scores as well as in subjects, viz., Hindi, Physics, Chemistry, Biology and Mathematics. This finding generally substantiated the trend seen in the beginning. The difference from the general pattern noticed in the case of Malayalam and Social Studies here and in the earlier analysis may be specially noted. That may be because they appeared to be comparatively simpler because when compared with other subjects, the concepts, principles and

other generalisations involved are less in number. This is only a guess, because accurate explanations require specific data gathered for that purpose.

However the difference thus noticed highlights the need for providing compensatory learning experiences for the Visually Handicapped pupils especially in Mathematics, Physics, Chemistry and Biology.

V. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII, EQUATED FOR INTELLIGENCE, SOCIO-ECONOMIC STATUS AND SEX (BOYS)

The investigator however decided to continue the comparison of equated groups, by controlling three variables at the same time and see how the results would change. The variables equated in this section of analysis are IQ, SES and Sex. Here boys of the two groups are compared by controlling their IQ and SES. After the process of matching, two smaller matched pairs were obtained for boys, the size being 24 each. These matched pairs were compared for their performance in the eight subject areas as well as in their total mean scores applying 't' test for small dependent samples.

The statistical indices used for the tests and the critical ratio of the two groups are presented in Table 16.

TABLE 16

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped pupils and Normal Pupils of Standard VIII equated for intelligence, socio-economic status and sex (boys)

Areas of scholastic performance	Groups compared		Mean difference mean	SE _{MD}	CR
	Normal pupils	Visually Handicapped pupils			
	N ₁ = 24	N ₂ = 24	Mean _D		
	Mean (M ₁)	Mean (M ₂)			
Malayalam	55.58	60.25	4.67	1.83	-2.55 *
English	35.08	33.96	+1.13	1.21	0.93
Hindi	37.13	32	+5.13	1.14	4.49**
Social Studies	38.29	40.75	2.46	1.62	-0.52
Physics	37.75	30.38	+7.38	1.16	6.34**
Chemistry	40.88	30.21	10.67	1.34	7.98**
Biology	45.42	33.04	12.38	1.38	8.94**
Mathematics	31.79	25.92	5.88	1.22	4.82**
Total school achievement	40.41	35.45	4.96	0.72	6.87**

** significant at 0.01 level

* significant at 0.05 level

Comments

When the boys of the two groups are compared for their mean scores by controlling intelligence and SES, a very significant change is noticed. There exists no significant difference between the groups in the case of English and Social Studies. In the case of Malayalam and Social Studies, the CRs are found to be negative. In the case of Malayalam the difference is significant only at 0.05 level. At the same time it has been noticed that in the case of five subjects, viz., Hindi, Physics, Chemistry, Biology and Mathematics and the total mean score, the two groups show significant difference in their mean scores, when intelligence, SES and sex were equated.

In general, the findings are further substantiating the initial conclusion indicating generally low achievement in the case of the visually handicapped. The deviations from the general pattern can be explained only on the basis of further analysis.

VI. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR IQ, SES, AND SEX (GIRLS)

What was done with respect to boys has been done with respect to girls also. That is, the three variables (IQ, SES and Sex) were controlled. After the process of matching two smaller matched pairs (each 17 in number) were compared for their performance in the eight subject areas as well as total performance using 't' test for small dependent samples.

The statistical indices used for the tests and the critical ratios of the two groups are presented in Table 17.

TABLE 17

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for intelligence, socio-economic status and sex (girls)

Areas of scholastic performance	Groups compared		Mean Difference Mean _D	SE _{MD}	CR
	Normal pupils	Visually Handicapped Pupils			
	N ₁ = 17	N ₂ = 17			
	Mean (M ₁)	Mean (M ₂)			
Malayalam	59.53	59.88	-0.35	1.02	0.35
English	44.94	38.18	6	2.18	3.10**
Hindi	44.59	40.94	3.65	1.10	3.30**
Social Studies	42.06	45.76	- 3.71	2.02	1.83
Physics	46.41	35.88	10.53	1.49	7.05**
Chemistry	47.41	35.53	11.88	1.99	5.97**
Biology	51.12	37.88	13.24	1.87	7.09**
Mathematics	39.35	32.35	7.00	1.78	3.93**
Total school achievement	46.93	40.80	6.13	1.05	5.84**

** significant at 0.01 level.

Comments

On comparing the girls of the two groups obtained after controlling their intelligence and SES, it has been inferred that there exist no significant difference between the girls of Visually Handicapped and Normal pupils in their performance in Social Studies and Malayalam.

At the same time, in the case of the total mean scores the two groups differ significantly beyond 0.01 level. This means that in spite of the three variables being equal (IQ, SES and Sex), the two groups generally show significant difference in the mean scholastic performance.

In the case of six subjects viz., English, Hindi, Physics, Chemistry, Biology and Mathematics also, the result is in favour of the normal group. So what has been said about achievement in general, is applicable to these six subjects as well.

By controlling one more variable (sex) from the previous section, we could nullify the difference that existed between the groups of Visually Handicapped pupils and Normal pupils (controlled IQ and SES) in their performance in Social Studies. This has been found to be same in the case of both boys and girls.

The general pattern, with significant difference in all the subjects except Malayalam and Social Studies, as well as in the total mean score, is found to be true in this case also. This substantiates in general the conclusion that the visually handicapped pupils are poorer than their normal counterparts, in scholastic performance.

VII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR IQ, SES, SEX AND RESIDENCE (RURAL BOYS)

This phase of the analysis has been conducted with yet another variable viz., residence of the subject too being controlled. The fact that there is rural urban difference in the educational performance of pupils provided the rationale for introducing this as an additional control variable. The equated groups of Visually Handicapped pupils and Normal pupils formed by controlling IQ, SES, Sex and residence were each of size 16. Here rural boys of the two groups were compared for their mean scores. The groups were subjected to 't' test for small dependent samples.

The statistical indices used for the tests and the results of the tests of significance are presented in Table 18.

TABLE 18

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for intelligence, socio-economic status sex and residence (rural boys)

Areas of scholastic performance	Groups compared		Mean difference Mean _D	SE _{MD}	CR
	Normal Pupils N ₁ = 17	Visually Handicapped Pupils N ₂ = 17			
	Mean(M ₁)	Mean (M ₂)			
Malayalam	60.47	58.76	1.71	1.15	1.48
English	37.46	31.94	5.53	0.99	5.59**
Hindi	38.06	13.35	7.71	1.17	6.58**
Social Studies	43.53	39.35	4.18	0.65	6.38**
Physics	48.76	29.06	19.71	1.67	11.78**
Chemistry	48.12	28.94	19.18	1.33	14.43**
Biology	52.47	32.06	20.41	1.96	10.43**
Mathematics	33.65	25.18	9.47	0.70	13.48**
Total school achievement	44.54	34.14	10.40	1.23	8.47**

** significant at 0.01 level.

Comments

While comparing the two groups of Visually Handicapped pupils and Normal pupils for their mean scores, after controlling four variables, viz., Intelligence, Socio Economic Status, Sex and Residence, it has been noticed that out of the nine pairs (8 subject and total mean score) the two groups differ significantly in their mean achievements in seven subjects viz., English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics as well as in the total mean scores, this being significant beyond 0.01 level (CR = 2.92 for N = 17). In the case of Malayalam alone the two groups do not differ significantly. The positive values of all CRs show that the Normal Pupils group is superior to the Visually Handicapped pupils.

It is observed that even after controlling four variables viz., Intelligence, SES, Sex and Residence, we cannot nullify the difference that exist between the groups in their mean scores in subjects viz., English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics. The total mean scores also differ significantly for the groups. This indicates that inspite of the four variables being equal, the two groups generally show difference in the mean scholastic performance. This also invites special attention required in

the education of Visually Handicapped pupils if we indent to compensate for their inadequacy.

The discrepancy noticed in has the case of Malayalam continues to remain in this case also. This may be because, .it being the mother tongue used for day to day communication, it is equally mastered by the visually handicapped too.

The similarity in the general pattern of the group difference noticed in all the different analyses needs special mention.

VII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII, EQUATED FOR IQ, SES, SEX AND RESIDENCE (RURAL GIRLS)

This part of the analysis has been devoted to the comparison of girls from the two equated groups of Visually Handicapped pupils and Normal pupils when the intervening variables like IQ, SES and residence also are controlled at the same time. Here rural girls of the two groups were taken for comparing their mean scores, to find out whether any significant difference exist between the groups. After the process of matching two equated groups each of size 16 have been obtained. The comparison was made applying the same statistical technique used earlier.

The statistical indices used for the tests and the results of the tests of significance are presented in Table 19.

TABLE 19

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal pupils of Standard VIII equated for intelligence, socio-economic status sex and residence (Rural girls)

Areas of Scholastic performance	Groups compared		Mean difference Mean _D	SE _{MD}	C.R
	Normal pupils N ₁ = 16	Visually Handicapped pupils N ₂ = 16			
	Mean(M ₁)	Mean (M ₂)			
Malayalam	63.56	58.75	4.81	1.39	3.45**
English	49.00	37.38	11.63	3.29	3.53**
Hindi	48.94	40.38	8.56	1.46	5.87**
Social studies	51.25	45.25	6	1.72	3.49**
Physics	47.25	36.88	10.38	1.84	5.63**
Chemistry	48.81	35.94	12.88	1.96	6.56**
Biology	53.13	38.25	14.88	2.44	6.11**
Mathematics	41.19	32.75	8.44	1.91	4.41**
Total school achievement	49.77	40.92	8.55	1.54	5.74**

** significant at 0.01 level.

Comments

When intelligence, socio-economic status, sex and residence were controlled at the same time and the Visually Handicapped pupils and Normal Pupils were compared for their achievements it has been noticed that they differ significantly in all the nine components of Achievements (8 subjects and total score average). It is found that in all these the difference is significant beyond 0.01 level (CR = 2.95 for N = 16). It indicates that inspite of the four variables being equal the rural girls of the two groups generally show difference in the mean scholastic performance. The positive sign of CR shows that the normal group is superior to their disadvantaged counterparts in their mean achievements in all the eight subject areas and the total mean scores.

Comparing the results (rural girls) to that of rural boys (previous one), it is found that, there exists difference between the groups in the mean score in Malayalam also unlike the case of boys.

Generally, when four variables are controlled, the differences that exist between the two groups (Visually Handicapped pupils and Normal pupils) in their mean scores,

on various subjects and in the total mean score could not be nullified. This again warrants concerted effort for compensation in the case of the visually handicapped.

IX. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD VIII EQUATED FOR INTELLIGENCE, SES, SEX AND RESIDENCE (URBAN BOYS)

This part of the analysis has been devoted to the comparison of the urban boys of the two groups of visually handicapped pupils and Normal pupils, when the roles of intelligence and SES also are partialled out. After the process of matching two equated groups, each of size 7 were obtained. The equated groups were compared for their means using 't' test for small dependent samples. The statistical indices used for the tests and the results of the tests of significance are presented in table 20.

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard VIII equated for intelligence, socio-economic status, sex and residence (urban boys)

Areas of scholastic performance	Groups compared		Mean difference Mean _D	SE _{MD}	CR
	Normal pupils N ₁ = 7	Visually Handicapped Pupils N ₂ = 7			
	Mean (M ₁)	Mean (M ₂)			
Malayalam	68.25	66.63	2.63	1.31	2.01
English	44.75	40.75	4	1.40	2.85 *
Hindi	43.50	37.75	5.75	1.00	5.78**
Social Studies	39.25	33.13	6.13	3.18	2.67 *
Physics	44.63	32.75	11.18	3.29	3.61**
Chemistry	50.88	35.0	15.88	3.84	4.13**
Biology	48.13	45.38	2.75	1.03	2.67 *
Mathematics	39.88	27.50	12.88	2.90	4.27**
Total school achievement	47.57	39.74	7.83	1.60	4.90**

** significant at 0.01 level

* significant at 0.05 level

Comments

After controlling the variables viz., IQ, SES, Sex and residence at the same time, the Visually Handicapped pupils and Normal pupils are found to significantly differ, in their mean scores of achievements in the case of seven subjects (except Malayalam Language) as well as in their total score. Of these, the difference in English, Social Studies and Biology are significant beyond 0.05 level (CR = 2.36 for N = 7) where as in the other two cases the difference is beyond 0.01 level (CR = 3.5 for N = 7) that there is no significant difference between the two groups in the case of the mothertongue is in tune with the finding obtained in some of the previous analyses. Though some slight variations are noticed in the extent of the significance of the difference between pairs, the general pattern remains almost the same.

The fact that in all the nine different stages of the analyses the difference remained uniformly significant at 0.01 level in the case of three subjects namely, Mathematics, Physics, and Chemistry needs special notice. This may be because their study involves mastery of a variety of concepts for which visual perception leading to observation, attribute analysis, comparison, classification, etc., are

required as pre-requisites. These concepts act as pre-requisites for mastering principles and processes that one to be applied in new situations. This adds to the difficulty in learning these subjects. This again calls for special methods helpful for meaningful conceptualization in the case of the visually handicapped.

Also it has to be noticed that in spite of slight variations, the general pattern exhibiting significant difference between the visually handicapped and normal groups persists throughout. This shows without doubt that visual handicap stands in the way of achieving high scores in most of the subjects even when intelligence and other advantageous factors come to their help. The consequence of this finding has to be taken seriously and steps taken to compensate for the debilitating effects of the disadvantage.

In general, the differences thus noticed between the two groups even after equating most of the significant intervening variables highlights the needs for providing compensatory learning experiences for the visually handicapped children especially in Mathematics and other Science subjects.

PART B

I. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE
UNSELECTED GROUPS OF VISUALLY HANDICAPPED PUPILS
AND NORMAL PUPILS OF STANDARD IX

The two groups of Visually Handicapped Pupils and Normal Pupils of Standard IX were compared for their mean achievement scores in the different subjects, using the two tailed test of significance for large independent samples. Critical Ratios indicating the difference between means were thus determined for the eight subjects of study as well as for the total performance. Using normal procedure for test of significance on the basis of critical ratios, it was examined whether the groups compared differ significantly or not. Only two levels of significance, viz., 0.01 level or 0.05 level have been considered for the comparison.

The details of the data for the groups compared at this stage are contained in Table 21.

TABLE 21

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the unselected groups of Visually Handicapped Pupils and Normal Pupils of Standard IX

Areas of Scholastic Performance	Groups compared				r	CR
	Normal Pupils $N_1 = 219$		Visually Handicapped Pupils $N_2 = 32$			
	Mean M_1	S.D. σ_1	Mean M_2	S.D. σ_2		
Malayalam	60.99	12.66	58.63	10.25	2.07	1.14 *
English	43.36	12.55	31.75	5.98	1.45	8.01**
Hindi	44.08	14.13	36.44	5.04	1.43	5.34**
Social Studies	48.24	10.97	51.13	7.36	1.56	-1.85
Physics	48.34	13.23	29.53	5.24	1.40	13.46**
Chemistry	47.97	10.66	32.31	5.25	1.25	12.49**
Biology	53.63	13.65	36.81	5.76	1.48	11.34**
Mathematics	44.44	11.33	26.13	6.04	1.39	13.14**
Total school Achievement	48.81	9.22	38.16	4.27	1.05	10.14**

** significant at 0.01 level

* significant at 0.05 level.

Comments

When the unselected groups of Visually Handicapped Pupils and Normal Pupils were compared for their scholastic performance in terms of the mean scores obtained, for the eight school subjects as well as the total performance it has been noticed that the two groups differ significantly in eight out of the nine variables, viz., performance in English, Hindi, Malayalam, Physics, Chemistry, Biology and Mathematics, and the total mean scores, the significance being beyond 0.01 level (CR=2.58) except Malayalam, where it is only at 0.05 level (CR=1.96). In the case of the subject social studies only no significant difference is noticed. In fact, the significant difference in the total mean scores indicates that the two groups in general are different in their mean scholastic achievements. Though only the two tailed test has been applied, the positive sign of the critical ratio (except in Social Studies) shows that the normal group is superior to their disadvantaged counterparts in their mean achievements.

However no significant difference has been noticed between Visually Handicapped Pupils and Normal Pupils in their mean achievement scores in Social Studies. This deviation from the general trend cannot be explained with

the available data.

As done in the case of Standard VIII under Analysis A, the comparison of the two groups in general has been followed by their comparison after controlling one or more variables viz. intelligence, SES, sex and locality of residence. The results of this analysis are given below.

TABLE 22

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Intelligence

Areas of scholastic Performance	Groups Compared				r	CR
	Normal Pupils		Visually Handicapped Pupils			
	N ₁ = 32		N ₂ = 32			
	Mean M ₁	S.D. σ_1	Mean M ₂	S.D. σ_2		
Malayalam	63.38	11.65	58.63	10.24	.16	1.61
English	43.87	12.67	31.75	6.00	-.87	3.79 **
Hindi	46.19	12.00	36.44	5.03	-.86	3.33 **
Social Studies	58.34	10.17	51.13	7.36	-.45	2.22 *
Physics	45.84	12.12	29.53	5.24	-.86	5.47 **
Chemistry	44.03	9.63	32.34	5.23	-.33	5.34 **
Biology	51.13	13.60	36.81	5.76	-.31	4.97 **
Mathematics	43.56	10.80	26.13	6.04	-.33	7.03 **
Total school Achievement	49.56	7.69	38.16	8.72	-.56	4.45 **

** significant at 0.01 level

* significant at 0.05 level

Comments

When the effect of intelligence was controlled before comparing the Normal and Visually Handicapped Pupils with respect to achievement, it has been noticed that the two groups show significant difference in the eight components (7 subjects and total score average). Of these seven cases, except in the mean score of Malayalam, the difference is significant beyond 0.01 level (CR = 2.75 for N = 32) while in the case of social studies the difference is at 0.05 level of significance (CR = 2.04 for N = 32).

From this we can conclude that there exists a real difference between the Visually Handicapped Pupils and Normal Pupils in their performance in the seven subject areas of school curriculum as well as in their total performance, even when their intelligence is controlled. The positive sign of the critical ratio show that the normal groups is superior to their disadvantaged counterparts in their mean achievements. This again substantiate the opinion raised earlier that special attention has to be endowed upon the visually handicapped, in spite of their intelligence, if they are to be brought on a par with the normal children. The fact that intelligence is not a factor contributing to the difference in the achievement of the

groups needs special mention.

III. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX EQUATED FOR SOCIO-ECONOMIC STATUS

In the previous part of the analysis, it was seen that equating the dominant factor namely, intelligence, did not nullify the difference noticed in the mean achievement of the Visually Handicapped Pupils. In this section of the analysis, an attempt has been made to form the sub-samples of Visually Handicapped Pupils and Normal Pupils by equating socio-economic status, another dominant intervening variables. The size of these sub-samples is 32 each. The two equated groups were then compared using 't' test for large dependent samples.

The statistical indices used for the tests and the results of the tests are given in table 23.

TABLE 23

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Socio-Economic Status

Areas of scholastic performance	Groups Compared				r	CR
	Normal Pupils		Visually Handicapped Pupils			
	N ₁ =32		N ₂ =32			
	Mean	S.D.	Mean	S.D.		
M ₁	1	M ₂	2			
Malayalam	61.28	12.51	58.63	10.25	-.78	.70
English	42.31	8.19	31.75	6.0	-.61	4.69 **
Hindi	46.50	9.69	36.44	5.03	-.73	4.12 **
Social Studies	50.75	10.24	51.13	7.36	.55	-.25
Physics	50.00	10.86	29.53	5.24	-.29	8.67 **
Chemistry	50.91	12.15	32.34	5.23	-.32	7.15 **
Biology	52.75	12.86	36.81	5.76	-.04	6.30 **
Mathematics	45.41	12.36	26.13	6.04	-.93	8.17 **
Total school achievement	49.91	8.49	38.16	4.30	-.34	6.19 **

** significant at 0.01 level

Comments

When socio-economic status was controlled and the mean scores of the group compared, some change from the previous inference has been noticed. The Visually Handicapped Pupils and Normal Pupils in their performance in the subjects, Malayalam and Social Studies showed no significant difference at 0.01 level ($CR = 2.75$ for $N = 32$). At the same time the two groups are found to differ significantly (beyond 0.01 level) with regard to their achievements in all the other subjects and the total mean scores. The fact that the total mean score differs significantly, for the two groups indicates that in spite of the SES being controlled, they generally show difference in the mean scholastic achievement. The positive sign of the Critical Ratio in all subjects that show significant difference indicates that the normal groups are superior to their disadvantaged counterparts in their performance in those subjects. Thus the present analysis is in tune with what was noted in the previous one.

It has been noticed that in the case of six individual subjects, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics the two groups are significantly different in their performance when SES was controlled. This means that controlling SES could not nullify the difference

between the two groups. However it has to be noted that the difference that existed in the case of social studies, in the previous case (when IQ was controlled) has been nullified while controlling SES. The fact that in Malayalam achievement also, the two groups are not significantly different too needs special mention.

IV. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX, EQUATED FOR BOTH INTELLIGENCE AND SOCIO-ECONOMIC STATUS

The previous sections of the analysis were intended to find out the specific roles of each of the variables intelligence and SES in causing educational differences in the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils. The present section and the subsequent sections of the analysis are intended to find out as to how equating of two or more intervening variables at the same time, would affect the original results.

This part of the analysis has been devoted to the comparison of the groups of Visually Handicapped Pupils and Normal Pupils, after partialling out intelligence and SES at the same time. After the process of matching, two equated groups of 32 pupils each were obtained. These equated groups were then compared for their mean achievement

scores using a 't' test for large dependent samples. The statistical indices used for the tests and the results of the tests of significance are given in Table 24.

TABLE 24

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Intelligence and Socio-Economic Status

Area of scholastic Performance	Groups compared				r	CR
	Normal Pupils		Visually Handicapped Pupils			
	N ₁ = 32		N ₂ = 32			
	Mean	S.D.	Mean	S.D.		
M ₁	1	M ₂	2			
Malayalam	57.63	13.75	58.63	10.24	-.09	-.32
English	43.31	15.33	31.75	6.0	-.62	3.34 **
Hindi	46.28	16.93	36.44	5.03	-.24	2.96 **
Social Studies	47.78	11.72	51.13	7.36	-.34	1.20
Physics	44.00	14.55	29.53	5.24	-.40	4.73 **
Chemistry	44.56	9.23	32.34	5.23	-.59	9.31 **
Biology	52.50	14.52	36.81	5.76	-.28	5.21 **
Mathematics	39.50	8.54	26.13	6.04	-.56	5.67 **
Total school achievement	47.04	10.35	38.16	4.32	-.66	3.72 **

** significant at 0.01 level

Comments

When the two variables, intelligence and socio-economic status were controlled at the same time it has been noticed that the two groups exhibit significant difference in six subjects out of the eight, as well as in the total mean achievement scores. The six subjects are, English, Hindi, Physics, Chemistry, Biology and Mathematics. The difference is at 0.01 level of significance ($CR = 2.75$ for $N = 32$). In the case of Malayalam and Social Studies no significant difference has been noted.

This leads to the conclusion that by partialling out the effect of major intervening variables IQ and SES, we could not nullify the difference that exists between the groups in their total mean scores as well as in six out of the eight subjects as indicated above. The Visually handicapped perform poorer when compared with their normal counterparts. This finding generally substantiates the trend seen in the previous analysis. The difference from the general pattern noticed in the case of Malayalam and Social Studies in the earlier analysis may be specially noted. That may be because they are comparatively simpler when compared with other subjects. This is only a guess, because accurate explanation requires specific data

gathered for that purpose.

However the difference thus noticed highlights the need for providing compensatory learning experiences for the Visually Handicapped Pupils especially in Mathematics, Physics, Chemistry and Biology.

V. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX, EQUATED FOR INTELLIGENCE, SOCIO ECONOMIC STATUS AND SEX (BOYS)

As done earlier, the analysis was continued after controlling three variables at the same time. The variables equated at this stage were intelligence, SES and sex. To start with, boys of the two groups were compared after controlling their IQ and SES. After the process of matching two smaller matched pairs were obtained for boys, the size being 12 each. These matched pairs were compared for their performance in the eight subject areas as well as in their total mean score applying 't' test for small dependent samples

The statistical indices used for the tests and the critical ratio of the two groups are presented in table 25.

TABLE 25

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX educated for Intelligence, Socio-Economic Status and Sex (Boys)

Areas of scholastic Performance	Normal Pupils N ₁ =22	Visually Handicapped Pupils N ₂ =22	Md	SEd	CR
	Mean (M ₁)	Mean (M ₂)			
Malayalam	61.95	57.45	4.50	3.39	1.33
English	41.18	31.95	9.23	2.06	4.48 **
Hindi	46.77	36.27	10.50	2.60	4.04 **
Social Studies	50.64	51.18	-.55	2.36	-.23
Physics	52.73	29.64	23.09	1.98	11.64 **
Chemistry	51.77	32.50	19.27	1.87	10.33 **
Biology	55.64	36.32	19.32	2.98	6.49 **
Mathematics	47.59	25.82	21.77	2.53	8.62 **
Total School achievement	51.21	37.57	13.53	1.42	9.56 **

** significant at 0.01 level

Comments

The pattern of the results is almost similar to that noticed in the previous analysis. There exists no significant difference between the groups in the case of Malayalam and social studies. At the same time it has been noticed that in the remaining six subjects viz., English, Hindi, Physics, Chemistry, Biology and Mathematics and the total mean scores, the two groups show significant differences, when intelligence, SES and Sex were equated, the performance being lower in the case of the Visually Handicapped.

In general, the findings further substantiates the initial conclusion indicating generally low achievement in the case of the visually handicapped.

VI. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX EQUATED FOR IQ, SES AND SEX (GIRLS)

What was done with respect to boys has been done with respect to girls also. After the process of matching two smaller matched pairs, each 10 in number, were obtained and these were compared for their performance in the eight subject areas as well as their total scores using 't' test for small dependent samples.

The statistical indices used for the tests and the critical ratios of the two groups are presented in ^{of}Table 26.

TABLE 26

Statistical indices and the results of the tests of significance used for comparing the **scholastic** performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Intelligence, Socio-Economic Status and Sex (Girls)

Areas of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 10$	$N_2 = 10$			
	Mean (M_1)	Mean (M_2)			
Malayalam	64.80	60.50	4.30	4.26	1.01
English	42.50	31.30	11.20	1.75	6.40 **
Hindi	52.80	38.20	14.60	4.48	3.26 **
Social Studies	59.10	50.80	8.30	3.32	2.50 *
Physics	53.60	29.20	24.40	3.22	7.58 **
Chemistry	57.30	31.60	25.70	3.82	6.73 **
Biology	59.60	36.90	22.70	3.86	5.88 **
Mathematics	50.80	25.30	25.50	3.93	6.49 **
Total School Achievement	55.42	37.98	17.44	2.58	6.76 **

** significant at 0.01 level

* significant at 0.05 level

Comments

On comparing the girls of two groups after controlling their intelligence and SES, it has been inferred that there exist no significant difference between the girls of Visually Handicapped Pupils and Normal Pupils in their performance in Malayalam.

At the same time, in the case of total mean scores the two groups differ significantly beyond 0.01 Level (CR = 3.25 for N = 10). This means that in spite of the three variables being equal (IQ, SES and SEX), the two groups generally show significant difference in the mean scholastic performance. Moreover the positive sign shows that the normal groups are superior to their disadvantaged counterparts in their mean achievement.

In the case of seven subjects viz.; English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics also, the result is in favour of the normal group. So what has been said about achievement in general is applicable to these seven subjects as well.

VII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX EQUATED FOR IQ, SES, **SEX** AND RESIDENCE (RURAL BOYS)

This phase of the analysis has been conducted with yet another variable viz. residence of the subject too being controlled. The groups thus equated for the four variables namely, IQ, SES, Sex (Boys only) and Residence were each of size 12. To start with, rural boys of the two groups were compared for their mean scores. The groups were subjected to 't' test for small dependent samples.

The statistical indices used for the test and the results of the tests of significance are presented in Table 27.

TABLE 27

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Intelligence, Socio-Economic Status, Sex and Residence (Rural Boys)

Areas of scholastic Performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 12$	$N_2 = 12$			
	Mean (M_1)	Mean (M_2)			
Malayalam	58.22	55.78	2.44	5.17	.47
English	43.44	31.56	11.89	4.02	2.96 *
Hindi	49.11	35.89	13.22	4.08	3.64**
Social Studies	47.89	52.22	- 4.33	2.87	-1.51
Physics	47.78	29.11	18.67	4.42	4.23**
Chemistry	49.44	32.11	17.33	4.46	3.89**
Biology	55.11	35.78	19.33	6.12	3.16**
Mathematics	41.67	28.22	13.44	2.19	6.15**
Total School Achievement	49.08	37.59	11.50	2.92	3.93**

** significant at 0.01 level

* significant at 0.05 level

Comments

While comparing the two groups of Visually Handicapped Pupils for their mean scores, after controlling four variables, viz., Intelligence, Socio-Economic Status, Sex and Residence, it has been noticed that out of the nine pairs (8 subjects and total mean score) the two groups differ significantly in their mean achievements in six subjects, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics as well as in the total mean scores, this being significant beyond 0.01 level (CR = 3.11 for N = 12) except for English where it is significant only at 0.05 level (CR= 2.20 for N = 12). In the case of Malayalam and Social Studies the two groups do not differ significantly.

It is thus observed that even after controlling four variables viz., Intelligence, SES, Sex and Residence, we cannot nullify the difference in the performance of the two groups except in the case of two subjects.

The discrepancy noticed in the case of Malayalam and Social Studies continues to remain in this case also. The similarity in the general pattern of the group difference noticed in all the different analyses needs special mention.

VIII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX, EQUATED FOR IQ, SES, SEX AND RESIDENCE (RURAL GIRLS)

This part of the analysis has been devoted in the comparison of girls from the two equated groups of Visually Handicapped Pupils and Normal Pupils when the intervening variables like, IQ, SES and Residence also controlled at the same time. Here rural girls of the two groups has been taken for comparison. After the process of matching, two equated groups each of size '9' have been obtained. The comparison was made applying the same statistical technique used earlier.

The statistical indices used for the tests and the results of the tests of significance are presented in Table 28.

TABLE 28

Statistical indices and the results of the tests of significance used for comparing the **scholastic** performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX educated for Intelligence, Socio-Economic Status, Sex and Residence (Rural Girls)

Areas of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 9$	$N_2 = 9$			
	Mean (M_1)	Mean (M_2)			
Malayalam	66.56	61.89	4.67	4.74	.98
English	43.44	32.44	11.00	1.94	5.67 **
Hindi	56.11	39.11	17.00	4.97	3.42 *
Social Studies	50.44	51.89	-1.44	3.16	-.46
Physics	55.22	29.78	25.44	3.40	7.48**
Chemistry	59.11	31.78	27.33	3.86	7.09**
Biology	61.11	37.11	24.00	4.07	5.90**
Mathematics	51.67	25.89	25.78	4.39	5.88**
Total school achievement	55.34	38.74	16.60	2.87	5.78**

** significant at 0.01 level

* significant at 0.05 level

Comments

When intelligence, socio-economic status, sex and residence were controlled at the same time and the Visually Handicapped Pupils and Normal Pupils were compared for their achievements, it has been noticed that they differ significantly in their performance in six out of the eight subjects as well as in the total performance. It is found that, in all these, the difference is significant beyond 0.01 level (CR = 3.36 for N = 9) except in Hindi where significance is only at 0.05 level (CR = 2.31 for N = 9). It indicates that at this stage of comparison the rural girls of the two groups generally show difference in their mean scholastic performance. The positive sign of all the CRs showing significance indicates that the normal groups are superior to their disadvantaged counterparts. The pattern is almost identical with that of the boys, done in the previous analysis.

IX. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD IX EQUATED FOR INTELLIGENCE, SES, SEX AND RESIDENCE (URBAN BOYS)

This part of the analysis has been devoted to the comparison of the urban boys of the two groups of Visually Handicapped Pupils and Normal Pupils, when the roles of

intelligence and SES are also partialled out. After the process of matching, two equated groups each of size 10 were obtained. The equated groups were compared for their means using 't' test for small dependent samples. The statistical indices used for the tests and the results of the tests of significance are presented in Table 29.

TABLE 29

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard IX equated for Intelligence, Socio-Economic Status, Sex and Residence (Urban Boys)

Area of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	N ₁ = 10	N ₂ = 10			
	Mean (M ₁)	Mean (M ₂)			
Malayalam	66.20	63.00	3.20	5.68	.56
English	43.70	33.00	10.70	2.64	4.05**
Hindi	41.80	37.60	4.20	2.54	1.65
Social Studies	55.80	50.10	5.70	4.68	1.22
Physics	59.00	31.90	27.10	4.55	5.95**
Chemistry	51.00	31.60	19.40	1.27	15.32**
Biology	54.50	36.60	17.90	3.90	4.59**
Mathematics	53.30	23.50	29.80	4.95	6.02**
Total School Achievement	53.66	38.43	15.23	2.35	6.48**

** significant at 0.01 level

Comments

After controlling the variables viz., IQ, SES, Sex and Residence (Urban) at the same time, the Visually Handicapped Pupils and Normal Pupils are found to be significantly differ in their mean scores of achievements in the case of five subjects, as well as in their total score. The difference is at 0.01 level of significance ($CR = 3.25$ for $N = 10$). But there is no significant difference between the groups in the case of three subjects viz. Malayalam, Hindi and Social Studies. Though slight variation are noticed in the extent of the significance of the difference between pairs, the general pattern remains almost the same.

The fact that in all the nine different stages of the analyses the difference remained uniformly significant at 0.01 level in the case of three subjects, viz., Mathematics, Physics, Chemistry and Biology needs special notice. This may be because their study involves mastery of a variety of concepts for which visual perception leading to observation, attribute analysis, comparison, classification, etc are required. Also mastery of these concepts are prerequisites for learning principles and mastering processes. This might have added to the problem faced by the Visually Handicapped This calls for special methods helpful for

meaningful conceptualisation in the case of the visually handicapped.

Also it has to be noticed that in spite of slight variations, the general pattern exhibiting significant difference between the visually handicapped and normal groups persists throughout. This shows without doubt that the visual handicap stands in the way of achieving high scores in most of the subjects even when intelligence and other advantageous factors come to their help. The consequence of this finding has to be taken seriously and steps taken to compensate for the debilitating effect of the disadvantage.

In general, the differences thus noticed between the two groups even after equating most of the significant intervening variables highlights the needs for providing compensatory learning experiences for the visually handicapped children especially in Mathematics and the Science subjects.

PART C

I. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE UNSELECTED GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X

The two groups of Visually Handicapped Pupils and Normal Pupils of Standard X were compared for their mean achievement scores in the different subjects, using the two tailed test of significance for small independent samples. Critical ratios indicating the difference between means were thus determined for the eight subjects of study as well as for the total performance. Using normal procedure for test of significance on the basis of critical ratios, it was examined whether the groups differ significantly or not. Only two levels of significance, namely, 0.01 level or 0.05 level have been considered for the comparison.

The details of the data for the groups compared at this stage are contained in table 30.

TABLE 30

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the unselected groups of Visually Handicapped Pupils and Normal Pupils of Standard X

Areas of scholastic Performance	Groups compared				SEd	CR
	Normal Pupils		Visually Handicapped Pupils			
	N ₁ = 155		N ₂ = 22			
	Mean M ₁	S.D. σ ₁	Mean M ₂	S.D. σ ₂		
Malayalam	62.66	10.84	59.64	4.65	2.36	1.28
English	42.15	13.00	32.18	6.79	2.85	3.50 **
Hindi	53.12	15.25	44.64	8.20	3.35	2.53 *
Social Studies	55.79	15.12	54.27	6.19	3.28	0.46
Physics	52.13	14.31	32.86	8.32	3.16	6.08 **
Chemistry	55.99	12.59	38.77	5.73	2.75	6.27 **
Biology	53.98	16.48	41.45	6.46	3.58	3.50 **
Mathematics	35.92	14.08	25.45	5.44	3.05	3.43 **
Total school Achievement	51.42	10.35	41.17	4.12	2.25	4.56 **

** significant at 0.01 level

* significant at 0.05 level

Comments

When the unselected groups of Visually Handicapped Pupils and Normal Pupils were compared for their educational performance in terms of the mean scores obtained, for the eight school subjects as well as the total performance it has been noticed that the two groups differ significantly in seven out of the nine variables, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics, and the total mean scores, the significance being beyond 0.01 level (CR = 2.62 for N = 22) except in Hindi, where the significance is only at 0.05 level (CR = 1.98 for N = 22). In the case of the subjects Malayalam and Social Studies no significant difference is noticed. In fact, the significant difference in the total mean scores indicates that the two groups in general are significantly different in their mean scholastic performance. Though only the two tailed test has been applied, the positive sign of the critical ratio can be used to interpret that the normal group is superior to their disadvantaged counterparts in their mean achievements. This warrants special attention in the case of the Visually Handicapped Pupils if their educational performance is to be brought on a par with their normal counterparts.

However no significant difference has been noticed between Visually Handicapped Pupils and Normal Pupils in their mean achievement scores in Malayalam and Social Studies. This is in agreement with the earlier findings.

As done for Standards VIII and IX, the analysis has been continued after controlling one or more of the intervening variables. The results are recorded in the following pages.

II. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X EQUATED FOR INTELLIGENCE

This part of the analysis has been devoted to the comparison of the groups when the role of intelligence is partialled out from the study. After doing so, the size of the two groups remained 22. The equated groups were compared for their mean achievement scores applying the 't' test for small dependent samples.

The statistical indices used for the tests and the results of the tests of significance are presented in table 31.

TABLE 31

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard X equated for Intelligence

Areas of scholastic Performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 22$	$N_2 = 22$			
	Mean (M_1)	Mean (M_2)			
Malayalam	62.32	59.64	2.68	1.53	1.76
English	46.23	32.18	14.05	2.30	6.10**
Hindi	55.27	44.64	10.64	2.95	3.60**
Social Studies	60.45	54.27	5.18	2.85	2.17**
Physics	54.68	32.86	21.82	3.28	6.65**
Chemistry	60.77	38.77	22.00	2.46	8.95**
Biology	61.59	41.45	20.14	3.82	5.27**
Mathematics	37.59	25.45	12.14	2.96	4.10**
Total school achievement	54.86	41.17	13.69	1.81	7.56**

** significant at 0.01 level

Comments

When the effect of intelligence was controlled before comparing the normal and Visually Handicapped Pupils with respect to achievement, it has been noticed that the two groups show significant difference in seven subjects viz., English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics as well as in the total mean scores. Of these, in six cases, except in the case of Social Studies, the difference is significant beyond 0.01 level (CR = 2.82 for N = 22) while in the case of social studies the difference is at 0.05 level of significant (CR = 2.04 for N = 22).

From this we can conclude that there exists a real difference between the Visually Handicapped Pupils and Normal Pupils in their performance in the seven subject areas of school curriculum as well as in their total performance, even when their intelligence is controlled. The positive sign of the Critical Ratios shows that the normal group is superior to their disadvantageous counterparts in their mean achievements. This again substantiates the opinion raised earlier that special attention has to be endowed upon the visually handicapped, irrespective of their intelligence, if they are to be brought

on a par with the normal children. The fact that intelligence is not a factor contributing to the difference in the achievement of the groups needs special mention.

III. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X EQUATED FOR SOCIO-ECONOMIC STATUS

In this section of the analysis, an attempt has been made to form the sub samples of Visually Handicapped Pupils and Normal Pupils by equating Socio Economic Status, another dominant intervening variable. This sub samples contained 22 numbers each, as 22 members of the normal group having equal socio-economic status were paired with the 22 visually handicapped pupils. The two equated groups were then compared using 't' test for small dependent samples.

The statistical indices used for the tests and the results of the tests are given in Table 32.

TABLE 32

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard X equated for Socio-Economic Status

Area of scholastic Performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 22$	$N_2 = 22$			
	Mean (M_1)	Mean (M_2)			
Malayalam	57.95	59.64	-1.69	2.61	.65
English	39.68	32.18	7.5	2.39	3.14 **
Hindi	53.73	44.64	9.09	3.08	2.95 **
Social Studies	59.32	54.27	5.05	3.38	1.49
Physics	49.55	32.86	16.68	1.87	8.92 **
Chemistry	54.72	38.77	15.95	2.59	5.15 **
Biology	52.45	41.45	11.00	4.00	2.75 *
Mathematics	35.55	25.45	10.0	2.63	3.80 **
Total school achievement	50.37	41.17	9.20	1.85	4.97 **

** significant at 0.01 level

* significant at 0.05 level.

Comments

When socio-economic status was controlled and the mean scores of the group compared, some change from the previous inference has been noticed. The Visually Handicapped Pupils and Normal Pupils in their performance in the subjects, Malayalam and Social Studies showed no significant difference. At the same time the two groups are found to differ significantly, with regard to their achievements in all the other subjects as well as in the total scores, this being significant at .01 level except in the case of Biology. It is very relevant that at this stage too, the general pattern seen earlier is found to be true. The inferior performance of the visually handicapped requires special attention.

IV. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X, EQUATED FOR BOTH INTELLIGENCE AND SOCIO-ECONOMIC STATUS

The previous sections of the analysis were intended to find out the specific roles of each of the variables intelligence and SES in causing educational differences in the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils. The present section and the subsequent sections of the analysis are intended to find out

as to how equating two or more intervening variables at a time, would effect the original results.

This part of the analysis has been devoted to the comparison of the groups of Visually Handicapped Pupils and Normal Pupils, after partialling out intelligence and SES at the same time. After the process of matching, two equated groups of 22 pupils each were obtained. These equated groups were compared for their mean achievement scores using 't' tests for small dependent samples. The statistical indices used for the tests and the results of the tests of significance are given in Table 33.

TABLE 33

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils for Standard X equated for Intelligence and Socio-Economic Status

Areas of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 22$	$N_2 = 22$			
	Mean (M_1)	Mean (M_2)			
Malayalam	59.95	59.64	.32	2.68	.12
English	42.36	32.18	10.18	2.61	3.89**
Hindi	56.23	44.64	11.59	3.71	3.12**
Social Studies	58.00	54.27	3.73	3.45	1.08
Physics	54.86	32.86	22.00	4.08	5.40**
Chemistry	54.64	38.77	15.86	2.50	6.35**
Biology	52.05	41.45	10.59	3.60	2.94**
Mathematics	38.77	25.45	13.32	3.32	4.01**
Total school achievement	51.72	41.17	10.80	2.53	4.27**

** significant at 0.01 level

Comments

When the two variables intelligence and socio-economic status are controlled at the same time, it has been noticed that the two groups exhibit significant difference in six subjects out of the eight, as well as in the total mean achievement scores. The six subjects are, English, Hindi, Physics, Chemistry, Biology and Mathematics. The difference is at 0.01 level of significance ($CR = 2.82$ for $N = 22$). In the case of Malayalam and Social Studies there is no significant difference at all.

This leads to the conclusion that by partialling out the effect of major intervening variables IQ and SES, we could not nullify the difference that exists between the groups in their total mean scores as well as in subjects viz., English, Hindi, Physics, Chemistry, Biology and Mathematics.

This finding generally substantiated the trend seen in the previous analyses. The difference from the general pattern noticed in the case of Malayalam and Social Studies in the earlier analyses is seen to persist at this stage also.

V. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X EQUATED FOR INTELLIGENCE, SOCIO-ECONOMIC STATUS AND SEX (BOYS)

The variables equated in this section of analysis are IQ, SES and Sex. Here boys of the two groups are compared by controlling their IQ and SES. After the process of matching, two smaller matched pairs were obtained for boys the size being 12 each. These matched pairs were compared for their performance in the eight subject areas as well as in their total mean score applying 't' test for small dependent samples.

The statistical indices used for the tests and the critical ratio of the two groups are presented in Table 34.

TABLE 34

Statistical indices and the results of the tests of significance used for comparing the ~~scholastic~~ performance of the groups of Visually Handicapped Pupils and Normal Pupils for Standard X equated for Intelligence, Socio-Economic Status and Sex (Boys)

Areas of scholastic performance	Normal Pupils $N_1 = 12$	Visually Handicapped Pupils $N_2 = 12$	Md	SEd	CR
	Mean (M_1)	Mean (M_2)			
Malayalam	61.50	58.50	3.00	2.50	1.20
English	40.75	32.67	8.08	2.62	3.08 **
Hindi	58.17	46.33	11.83	4.07	2.91 *
Social Studies	51.92	52.83	- .92	4.61	-.20
Physics	49.42	35.17	14.25	2.74	5.21**
Chemistry	56.25	40.67	15.58	3.14	4.96**
Biology	59.92	44.00	15.92	5.57	2.86 *
Mathematics	36.50	25.00	11.50	2.55	4.52**
Total school achievement	51.80	41.90	9.91	2.31	4.29**

** significant at 0.01 level

* significant at 0.05 level

Comments

As boys of the two groups are compared for their mean scores by controlling intelligence and SES, the pattern is found to be almost the same. It is seen that no significant difference exists between the groups in the case of Malayalam and Social Studies. At the same time it has been noticed that in the case of six subjects vis., English, Hindi, Physics, Chemistry, Biology and Mathematics, and the total mean score the two groups show significant difference, at 0.01 level in five cases and 0.05 level in the case of Hindi and Biology.

In general, the findings further substantiates the initial conclusion indicating generally low achievement in the case of the visually handicapped.

VI. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED AND NORMAL PUPILS OF STANDARD X EQUATED FOR IQ, SES AND SEX (GIRLS)

What was done with respect to boys has been done with respect to girls also. That is the three variables (IQ, SES and SEX) were controlled. After the process of matching two smaller matched pairs, each 10 in number, were compared for their performance in the eight subject areas and total

performance using 't' test for small dependent samples.

The statistical indices used for the tests and the critical ratios of the two groups are presented in Table 35.

TABLE 35

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils for Standard X equated for Intelligence, Socio-Economic Status and Sex (Girls)

Areas of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	N ₁ =10	N ₂ = 10			
	Mean (M ₁)	Mean (M ₂)			
Malayalam	61.90	60.60	1.30	1.83	.71
English	50.30	33.50	16.80	4.95	3.39 **
Hindi	64.90	44.30	20.60	4.66	4.43**
Social Studies	65.00	57.30	7.70	4.72	1.63
Physics	56.40	31.60	24.80	3.31	7.49**
Chemistry	54.90	37.20	17.70	4.11	4.31**
Biology	55.80	38.00	17.80	3.81	4.67**
Mathematics	45.60	26.10	19.50	5.80	3.36**
Total school achievement	56.98	41.08	15.9	2.18	7.29**

** significant at 0.01 level

Comments

On comparing the girls of two groups after controlling their intelligence and SES, it has been inferred that the pattern of difference continues to be similar. There exists no significant difference between the girls of visually handicapped pupils and normal pupils in their performance in Malayalam and Social Studies.

At the same time in the case of the total mean scores and six subjects namely, English, Hindi, Physics, Chemistry Biology and Mathematics there exist differences significant beyond 0.01 level, the difference being in favour of the normal group. So what has been said about achievement in general is applicable at this stage of the analysis too.

This substantiates in general the conclusion that the Visually Handicapped are poorer than their normal counterparts, in scholastic performance.

VII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED AND NORMAL PUPILS OF STANDARD X EQUATED FOR IQ, SES, SEX AND RESIDENCE (RURAL BOYS)

This phase of the analysis has been conducted with yet another variable viz., residence of the subject too being controlled. The equated groups of Visually Handicapped and

Normal Pupils formed by controlling IQ, SES, Sex and Residence (rural) were each of size '9'. Here rural boys of the two groups are compared for their mean scores. The groups were subjected to 't' test for small dependent samples.

The statistical indices used for the tests and the results of the tests of significance are presented in table 36.

TABLE 36

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard X equated for Intelligence, Socio-Economic Status Sex and Residence (Rural Boys)

Areas of scholastic Performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 9$ Mean (M_1)	$N_2 = 9$ Mean (M_2)			
Malayalam	61.11	59.44	1.67	3.19	.52
English	40.44	34.89	5.56	1.58	3.51 **
Hindi	59.89	47.00	12.89	4.56	2.83 *
Social Studies	55.78	53.33	2.44	5.87	.42
Physics	50.56	36.44	14.11	3.12	4.53**
Chemistry	59.33	40.78	18.55	4.34	4.28**
Biology	59.11	43.78	15.33	6.48	2.36 *
Mathematics	36.11	25.67	10.44	2.40	4.35 **
Total school achievement	52.79	42.67	10.12	3.18	3.48 **

** significant at 0.01 level

* significant at 0.05 level

Comments

While comparing the two groups of Visually Handicapped pupils and Normal Pupils for their mean scores, after controlling four variables viz. Intelligence, Socio-Economic Status, Sex and Residence, it has been noticed that the pattern continues to be similar with slight variation. The two groups are found to differ significantly in their mean achievements in six subjects, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics as well as in the total mean scores. Except in the case of Hindi and Biology the difference is significant beyond 0.01 level (CR = 3.36 for N = 9). In the case of Hindi and Biology, it is significant at 0.05 level only (CR = 2.31 for N = 9). In the case of Malayalam and Social Studies, the two groups do not differ significantly as in the previous cases. The positive values of all Critical ratios show that the Normal Pupils group is superior to the Visually Handicapped Pupils. This further substantiates the earlier findings.

VIII. COMPARISON OF THE MEAN ACHIEVEMENT SCORES OF THE GROUPS OF VISUALLY HANDICAPPED PUPILS AND NORMAL PUPILS OF STANDARD X, EQUATED FOR IQ, SES, SEX AND RESIDENCE (RURAL GIRLS)

This part of the analysis has been devoted to the comparison of girls from the two equated groups of Visually

Handicapped Pupils and Normal Pupils when the Intervening variables like, IQ, SES and Residence also are controlled at the same time. After the process of matching, two equated groups each of size 8 have been obtained. The comparison was made applying the same statistical technique used earlier.

The statistical indices used for the tests and the results of the tests of significance are presented in Table 37.

TABLE 37

Statistical indices and the results of the tests of significance used for comparing the scholastic performance of the groups of Visually Handicapped Pupils and Normal Pupils of Standard X equated for Intelligence, Socio-Economic Status, Sex and Residence (Rural Girls)

Areas of scholastic performance	Normal Pupils	Visually Handicapped Pupils	Md	SEd	CR
	$N_1 = 8$	$N_2 = 8$			
	Mean (M_1)	Mean (M_2)			
Malayalam	64.00	60.50	3.50	2.87	1.22
English	53.25	29.88	23.37	7.62	3.07 *
Hindi	62.38	41.63	20.75	5.84	3.55**
Social Studies	63.25	55.50	7.75	6.44	1.20
Physics	56.63	29.88	26.75	2.90	9.22**
Chemistry	55.00	35.63	19.38	4.27	4.54**
Biology	52.88	37.13	15.75	3.16	4.99**
Mathematics	41.75	25.88	15.88	3.55	4.47**
Total school achievement	56.14	39.52	16.62	3.67	4.53**

** significant at 0.01 level

* significant at 0.05 level

Comments

When intelligence, socio-economic status, sex and residence were controlled at the same time, and the visually handicapped pupils and normal pupils were compared for their achievements it has been noticed that they do not differ in the case of Malayalam and Social Studies. But they differ significantly in six subjects viz., English, Hindi, Physics, Chemistry, Biology and Mathematics, and the total mean scores. It is found that in all these, except in English, the difference is significant beyond 0.01 level (CR = 3.50 for N = 8), whereas in the case of English, it is significant at 0.05 level (CR = 2.36 for N = 8). The pattern seen with regard to the difference of the groups is thus found to persist at this stage the analysis too.

Since the total number of urban pupils among the Visually Handicapped was very small influencing only five (three boys and two girls) analysis has not been made for the group.

PART D

COMPARISON OF THE ANALYSIS OF THE THREE STANDARDS AT A GLANCE

In order to facilitate a very general view of the results of the analysis done with respect to each standard, the consolidated results of these analysis^o are given in Tables 38, 39 and 40.

TABLE 38

Consolidated summary of the tests of significance of the unselected groups of Visually Handicapped Pupils and Normal Pupils and their different equated groups of Standard VIII

Subjects of Elastic Performance	Unselected groups of Visually Handicapped Pupils (VHPs) and Normal Pupils (NPs)	Equated groups of VHPs and NPs (IQ equated)	Equated groups of VHPs and NPs (SES equated)	Equated groups of VHPs and NPs (IQ + SES equated)	Equated groups of VHPs and NPs (IQ + SES + Sex) Boys	Equated groups of VHPs and NPs (IQ + SES +sex) Girls	Equated groups of VHPs and NPs (IQ+ SES+SEX+ residence) Rural Boys	Equated groups of VHPs and NPs (IQ + SES + Sex+ Residence) Rural Girls	Equated groups of VHPs and NPs (IQ+ SES+ residence) Urban
	N ₁ = 266 N ₂ = 41	N ₁ = 41 N ₂ = 41	N ₁ = 41 N ₂ = 41	N ₁ = 41 N ₂ = 41	N ₁ = 24 N ₂ = 24	N ₁ = 17 N ₂ = 17	N ₁ = 17 N ₂ = 17	N ₁ = 16 N ₂ = 16	N ₁ = 16 N ₂ = 16
Mathematics	.89	3.50 **	1.79	2.40 *	-2.55 *	.35	1.48	3.45**	2.0
English	3.50 **	4.98 **	5.17 **	4.56 **	.93	3.10 **	5.59 **	3.53 **	2.85
History	3.28 **	4.60 **	3.73 **	4.22 **	4.49 **	3.30 **	6.58 **	5.87 **	5.78
Physical Studies	2.54 **	2.41 **	1.34	2.10	-.52	1.83	6.38 **	3.49 **	2.6
Science	8.30 **	5.38 **	7.90 **	7.50 **	6.34 **	7.05 **	11.78 **	5.63 **	3.5
Geography	10.43 **	5.74 **	5.96 **	7.24 **	7.98 **	5.97 **	14.43 **	6.56 **	4.1
Arithmetic	10.33 **	5.74 **	4.91 **	5.77 **	8.94 **	7.09 **	10.43 **	6.11 **	2.6
Statistics	5.53 **	5.17 **	2.94 **	4.93 **	4.82 **	3.93 **	13.48 **	4.41 **	4.2
Physical Education	6.82 **	5.69 **	4.71 **	5.85 **	6.87 **	5.84 **	8.47 **	5.74 **	4.9

** Significant at 0.01 level
* Significant at 0.05 level.

TABLE 39

Consolidated summary of the tests of significance of the unselected groups of Visually Handicapped Pupils and Normal pupils and their different equated groups of Standard IX

Subjects of Academic Performance	Unselected groups of Visually Handicapped Pupils (VHPs) And Normal Pupils (NPs)	Equated groups of VHPs and NPs (IQ equated)	Equated groups of VHPs and NPs (SES, equated)	Equated groups of VHPs and NPs (IQ + SES equated)	Equated groups of VHPs and NPs (IQ + SES + Sex) Boys	Equated groups of VHPs and NPs (IQ + SES + Sex) Girls	Equated groups of VHPs and NPs (IQ+ SES+Sex+ residence) Rural Boys	Equated groups of VHPs and NPs (IQ+ SES + Sex+ Residence) Rural Girls	Equated groups of VHPs and NPs (IQ+ SES+Sex+ Residence) Urban
	N ₁ = 219 N ₂ = 32	N ₁ = 32 N ₂ = 32	N ₁ = 32 N ₂ = 32	N ₁ = 32 N ₂ = 32	N ₁ = 22 N ₂ = 22	N ₁ = 10 N ₂ = 10	N ₁ = 12 N ₂ = 12	N ₁ = 9 N ₂ = 9	N ₁ = 9 N ₂ = 9
Malayalam	1.14 *	1.61	.70	-.32	1.23	1.01	0.47	.98	
English	8.01 **	3.79 **	4.69 **	3.34 **	4.48 **	6.40 **	2.96 *	5.67 **	4.67 **
Hindi	5.34 **	3.33 **	4.12 **	2.96 **	4.04 **	3.26 **	3.64 **	3.42 *	1.85
Social Studies	-1.85	2.22 *	-.25	1.20	-.23	2.50 *	-1.51	-.46	1.85
Physics	13.46 *	5.47 **	8.67 **	4.73 **	11.64 **	7.58 **	4.23 **	7.48 **	5.47 **
Chemistry	12.49 **	5.34 **	7.15 **	9.31 **	10.33 **	6.73 **	3.89 **	7.09 **	15.49 **
Biology	11.34 **	4.97 **	6.30 **	5.21 **	6.49 **	5.88 **	3.16 **	5.90 **	4.97 **
Mathematics	13.14	7.03 **	8.17 **	5.67 **	8.62 **	6.49 **	6.15 **	5.88 **	6.30 **
Overall school achievement	10.14 **	4.45 **	6.19 **	3.72 **	9.56 **	6.76 **	3.93 **	5.78 **	6.19 **

* significant at 0.01 level
 ** significant at 0.05 level.

TABLE 40

Consolidated summary of the tests of significance of the unselected groups of Visually Handicapped Pupils and Normal Pupils and their different equated groups of Standard X

Areas of Scholastic performance	Unselected groups of Visually Handicapped Pupils (VHPs) and Normal Pupils (NPs)	Equated groups of VHPs and NPs (IQ equated)	Equated groups of VHPs and NPs (SES equated)	Equated groups of VHPs and NPs (IQ + SES equated)	Equated groups of VHPs and NPs (IQ + SES + Sex) Boys	Equated groups of VHPs and NPs (IQ + SES + Sex) Girls	Equated groups of VHPs and NPs (IQ + SES + Sex + residence) Rural Boys	Equated groups of VHPs and NPs (IQ + SES + Sex + residence) Rural Girls
	$N_1 = 155$ $N_2 = 22$	$N_1 = 22$ $N_2 = 22$	$N_1 = 22$ $N_2 = 22$	$N_1 = 22$ $N_2 = 22$	$N_1 = 12$ $N_2 = 12$	$N_1 = 10$ $N_2 = 10$	$N_1 = 9$ $N_2 = 9$	$N_1 = 8$ $N_2 = 8$
Malayalam	1.28	1.76	.65	.12	1.20	.71	.52	1.22
English	3.50 **	6.10 **	3.14 **	3.89 **	3.08 **	3.39 **	3.51 **	3.07 *
Hindi	2.53 *	3.60 **	2.95 **	3.12 **	2.91 *	4.43 **	2.83 *	3.55 **
Social Studies	.46	2.17 *	1.49	1.08	-.20	1.63	.42	1.20
Physics	6.08 **	6.65 **	8.92 **	5.40 **	5.21 **	7.49 **	4.53 **	9.22 **
Chemistry	6.27 **	8.95 **	6.15 **	6.35 **	4.96 **	4.31 **	4.28 "	4.54 **
Biology	3.50 **	5.27 **	2.75 *	2.94 **	2.86 *	4.67 **	2.36 *	4.99 **
Mathematics	3.43 **	4.10 **	3.80 **	4.01 **	4.52 **	3.36 **	4.35 **	4.47 **
Total school achievement	4.56 **	7.56 **	4.97 **	4.27 **	4.29 **	7.29 **	3.48 **	4.53 **

** significant at 0.01 level
* significant at 0.05 level

Comments

The analysis, for convenience, had been done earlier separately for each standard. To get a more meaningful understanding of the results and to examine whether any common pattern exists in the nature of the difference exhibited by the normal group and the visually handicapped group, the three consolidated tables have been subjected to comparison. It has been noted that the general pattern remains the same in the case of all the three standards.

The most striking aspect noticed is that in the case of all the analyses with the different intervening variables controlled, the general pattern noticed in the beginning remains the same without much variation, showing that generally the Visually handicapped group are lower in their scholastic performance compared with their normal counterparts.

Even in stray cases where slight variations are seen, that have been noticed only with respect to one or two subjects like Malayalam (mothertongue) and Social Studies. In this variation too the pattern is similar for all the three standards.

In the case of science subjects and mathematics the

difference between the two groups are found to reveal a very constant pattern in which the two groups always differ significantly even when different intervening variables are partialled out.

Thus the general pattern of scholastic performance of the groups remains almost the same throughout in all the three standards, showing a weakness in the scholastic performance of the visually handicapped pupils. The general feature in the pattern of achievement has a very important implication for the planners of integrated education, the most important of which is the need for a well planned scheme of compensatory education for the disadvantaged.

PART E

COMPARISON OF THE MEAN DIFFERENCES IN VARIOUS LEVELS OF
COGNITIVE ACHIEVEMENT (K,U,A) OF THE VISUALLY
HANDICAPPED AND NORMAL PUPILS

The two equated groups (equated for IQ and SES) of visually handicapped pupils and normal pupils of Standards VIII, IX and X were compared for mean difference in the different levels of cognitive achievement in the different school subjects for the purpose, the items in the tests were classified under Knowledge, Understanding and Application levels. The scores of pupils for each of these categories was determined and the means and standard deviations determined. Then the two tailed test of significant (as the case may be) was applied for the comparison. It is evident that any critical ratio in respect of any of the three levels in each subject in favour of the normal group would show that the mean performance of that group in that level of the subject is significantly superior to that of the group of visually handicapped. Critical ratios of 2.71 (N = 41) for standard VIII, 2.75 (N=32) for standard IX and 2.82 (N = 22) for Standard X would show significant difference at 0.01 level and 2.07 (N = 22), 2.04 (N = 32) and 2.02 (N= 41) respectively would indicate significant

difference at 0.05 level. The statistical indices used for the tests and the results of the tests of significance are presented in tables ^{a.} 41, 42 and 43.

TABLE 41

Results of the tests of significance of mean difference
in the three levels of cognitive achievement in the
school subjects of the two groups of Visually
Handicapped Pupils and Normal Pupils of
Standard VIII equated for intelligence
and Socio-Economic Status

Areas of scholastic performance	Levels of Cognition Critical Ratio		
	Knowledge (K)	Under- standing (U)	Application (A)
Malayalam	.99	2.84 **	5.48 **
English	.40	2.98 **	5.51 **
Hindi	1.81	.92	5.58 **
Social Studies	-.63	-1.25	5.89 **
Physics	3.09 **	3.05 **	5.78 **
Chemistry	2.97 **	2.85 **	5.82 **
Biology	2.58 **	3.68 **	5.78 **
Mathematics	2.96 **	4.36 **	5.92 **

Sample size $N_1 = 41$ $N_2 = 41$

** significant at 0.01 level

Comments

An examination of the table in general shows that there is a meaningful pattern with regard to the difference in the mean scores of achievement at the various levels in the case of all subjects though there are a few exceptions. The pattern is that generally in the case of all subjects, the groups are found to be significantly different in their achievements at the application level at 0.01 level of significance (CR = 2.71 for N = 41). In the case of understanding, the two groups are found to be significantly different in the case of six out of eight subjects. The two subjects that do not indicate significant difference are Hindi and Social Studies. When we came to the knowledge level the picture appears still different. Only in the case of four out of the eight subjects (viz., Physics, Chemistry, Biology and Mathematics) do the group show significant difference. Of these three are beyond the 0.01 level and one beyond 0.05 level. In the case of the other four subjects viz., Malayalam, English, Hindi and Social Studies, the groups do not exhibit any significant difference. In all the cases indicating difference, the scores are found to be higher in the case of normal pupils than in the case of the visually handicapped.

From these findings the following conclusions could be arrived at:

1. The Visually Handicapped are found to be disadvantaged more at the application level rather than at the knowledge and understanding levels in the case of all the subjects.

The common learning experiences required for learning at the information (Knowledge) level is mostly rote memorisation, which do not normally require visual perception to a great extent. But when we think of concepts at the understanding level and principles and processes at the application level, visual perception leading to attribute analysis, comparison, classification, generalisation, analysis, synthesis, etc., become essentially required. That is the possible reason for this trend.

2. When the two levels of understanding and knowledge are compared it is noticed that in more subjects, the two groups show significant difference in achievement, in items involving understanding (six out of eight). The least number of subjects where the two groups differ is in the case of knowledge items (four out of eight).

3. In all the three levels of cognition, the two groups

are found to differ significantly in four subjects, viz., Physics, Chemistry, Biology and Mathematics. This finding is comparable to what was noticed with regard to the general achievements.

The above three findings need special interpretation and attention.

- 1) First of all, the learning difficulties that are likely to be faced by the visually handicapped pupils while attempting to achieve deep level cognition is revealed by the uniformly noticed difference at the application level, in favour of the normal children. This is because application of knowledge warrants higher order specific behaviours required for establishing new relations in novel situations, which is the special feature of the ability for application. Locating problematic situations, analysing complicated phenomena, hypothesising, looking for relevant data, testing hypotheses, generalising etc. are mental operations associated with application. For this, internalisation of related concepts, principles, and process is essentially required. This warrants perception mainly visual in nature. Hence the findings that the visually handicapped are generally inferior to their normal counterparts in their ability to apply is quite

meaningful. This warrants very well planned compensatory programmes that could help them internalise the concepts as meaningful as possible. These experiences should certainly be different from visual classifications.

2. The hierarchy seen in the degree of attainment with respect to the other two levels of cognition also is an extension of the previous finding. Though in the case of two subjects viz., Hindi and Social Studies, significance difference does not exist at the understanding level, in the majority of cases such a difference is prevalent. This is quite natural as understanding warrants mental processes like comparison, illustration, etc., leading to identification of relations. Hence the visually handicapped are likely to be disadvantaged especially in understanding subjects where such mental operations are essentially required.

3. The fact that in the case of four subjects viz., Malayalam, English, Hindi and Social Studies the two groups do not differ significantly in the case of knowledge (information) is due to the comparatively low level of mental operations involved in gathering information, namely recalling and recognising. This especially in subjects with more verbal content, can be achieved without visual perception. But there also, in the case of other subjects where even recall

and recognition warrant observation (for example, Physics, Chemistry, Biology and Mathematics), the Visually Handicapped group will definitely be in a disadvantageous condition.

Thus the pattern noticed in the analysis throws much light into the teaching learning strategy to be designed for the visually handicapped to lead them to deeper levels of cognition. These strategies should involve activity oriented programmes suited to their strength and weakness rather than mere verbal explanations. The special advantage arising out of compensation through other senses should be used to the maximum possible.

TABLE 42

Results of the tests of significance of mean difference of cognitive achievement in school subjects classified under knowledge, understanding and application levels of the two groups of visually handicapped pupils and normal pupils of Standard IX equated for intelligence and socio-economic status

Areas of scholastic performance	Levels of cognition		
	Knowledge (K)	Understanding (U)	Application (A)
Malayalam	.88	.21	3.40 **
English	3.60 **	3.44 **	4.74 **
Hindi	2.85 **	2.85 **	4.38 **
Social Studies	-2.00	-.65	2.71 *
Physics	4.89 **	4.62 **	4.89 **
Chemistry	4.39 **	3.74 **	5.10 **
Biology	4.11 **	3.59 **	4.81 **
Mathematics	4.16 **	4.21 **	4.95 **

Sample size $N_1 = 32$ $N_2 = 32$

** significant at 0.01 level

* significant at 0.05 level

Comments

An examination of the table in general shows that in Standard IX also there is a meaningful pattern with regard to the mean scores of achievement at the various levels in the case of all subjects though there are a few exceptions. The pattern is that generally, in the case of all subjects, the groups are found to be significantly different in their achievement at the application level at 0.01 level of significance ($CR = 2.75$ for $N = 32$) except in Social Studies, where the difference is significant only at 0.05 level ($CR = 2.04$). In the case of understanding the two groups are found to be significantly different in the case of six subjects. The two subjects that do not indicate significant difference are Malayalam and Social Studies. When we came to the knowledge level the picture is the same as that of the understanding level. In all the cases indicating difference the scores are found to be higher in the case of normal pupils than in the case of visually handicapped.

From these findings the following conclusions could be arrived at:

1. The visually handicapped are found to be disadvantaged more at the application level than at the knowledge and understanding levels - in the case of all the subjects.

2. When the two levels of understanding and knowledge are compared it is noticed that the two groups show significant difference in achievement^{ei} in six out of the eight subjects.
3. In all the three levels of cognition, the two groups are found to differ significantly in the six subjects, viz., English, Hindi, Physics, Chemistry, Biology and Mathematics.

However, it is to be specially noted that in the case of information also the two groups show significant differences in more subject than the ones found in Standard VIII.

This may be attributed to the fact that as we go higher up in standards the depth of the content learnt and hence the difficulty level also are likely to increase and as such the visually handicapped will be in a disadvantageous position even at the knowledge level of cognition.

TABLE 43

Results of the tests of significance of mean difference of cognitive achievement in the school subject classified under knowledge, Understanding and application levels of the two groups of visually handicapped pupils and Normal pupils of Standard X equated for intelligence and socio-economic status

Areas of scholastic performance	Levels of Cognition critical ratio		
	Knowledge (K)	Under- standing (U)	Application (A)
Malayalam	-1.48	1.45	5.11 **
English	4.1 **	6.06 **	6.31 **
Hindi	1.29	1.76	4.93 **
Social Studies	-1.86	1.35	4.49 **
Physics	6.27 **	5.74 **	6.02 **
Chemistry	6.65 **	5.64 **	8.84 **
Biology	3.32 **	5.44 **	6.61 **
Mathematics	2.84 **	2.93 **	5.45 **

Sample size = $N_1 = 22$ $N_2 = 22$

** significant at .01 level

Comments

An examination of the table in general shows that in Standard X also there is a meaningful pattern with regard to the mean scores of achievement at the various levels in the case of all subjects though there are a few exceptions. The pattern is that generally in the case of all subjects, the groups are found to be significantly different in their achievement at the application level at 0.01 level ($CR=2.82$ for $N = 22$) In the case of understanding and knowledge levels the two groups are found to be significantly different in the case of five subjects. The three subjects that do not indicate significant difference are Malayalam, Hindi and Social Studies. In all the cases indicating difference, the scores are found to be higher in the case of normal pupils than in the case of the visually handicapped.

From these findings the following conclusions could be arrived at:

- 1) The visually handicapped are found to be disadvantaged more at the application level than at the knowledge and understanding levels - in the case of all the subjects.
- 2) When the two levels, understanding and knowledge are compared it is noticed that in both the levels the two

groups show significant difference in achievement in five subjects out of eight. Note that this has been ~~five~~ six subjects in the case of standard IX.

- 3) In all the three levels of cognition, the two groups are found to differ significantly in the five subjects, viz., English, Physics, Chemistry, Biology and Mathematics.

The above three findings need special interpretation and attention:

- 1) First of all, the learning difficulties that are likely to stand in the way of the visually handicapped pupils achieving deep level cognition is revealed by the uniformly noticed difference at the application level, in favour of the normal children.
- 2) The fact that in the case of three subjects, viz., Malayalam Hindi and Social Studies the two groups do not differ significantly in the case of knowledge (information) and understanding may be due to the comparatively low level of mental operations involved in the teaching procedures followed. The similarity seen in the degree of attainment with respect to both these levels shows that as we go higher up in standards the depth of the content learnt

increases and hence the difficulty level also is likely to increase and as such the visually handicapped who do not get opportunity for enough visual perception will be in a disadvantageous position.

General Observation

While examining the pattern in the difference in the three standards taken together, the fact remains that in all the three cases, the groups invariably show significant difference in the case of all the subjects at the application level of cognition. Also the number of cases where the difference is noticed, generally decreases from application to understanding and then to knowledge. This substantiate the detailed discussion made while interpreting the results of analysis of Standard VIII.

PART F

GRAPHICAL COMPARISON OF THE VISUALLY HANDICAPPED AND
NORMAL PUPILS FOR THEIR MEAN SCORES IN THE EIGHT SUBJECT
AREAS OF SCHOOL CURRICULUM AND THEIR TOTAL PERFORMANCE

In order to get a total visual picture of the results, comparison of the performance of the total groups of visually handicapped and normal pupils also has been attempted. So this has been done

- 1) To compare the mean scores of the two groups (unselected groups for the eight subjects and their total score average).
- 2) To compare the mean scores of two groups (equated for intelligent and socio-economic status) for the eight subjects and their total score averages and
- 3) To compare their performance in the three levels of cognition with respect to the eight subjects. Such graphs have been drawn separately for the three standards. The graphs thus drawn are presented as Figures 1 to 9.

Fig.1. Histogram showing the scholastic performance of Normal & visually handicapped pupils of standard VIII (Unselected groups)

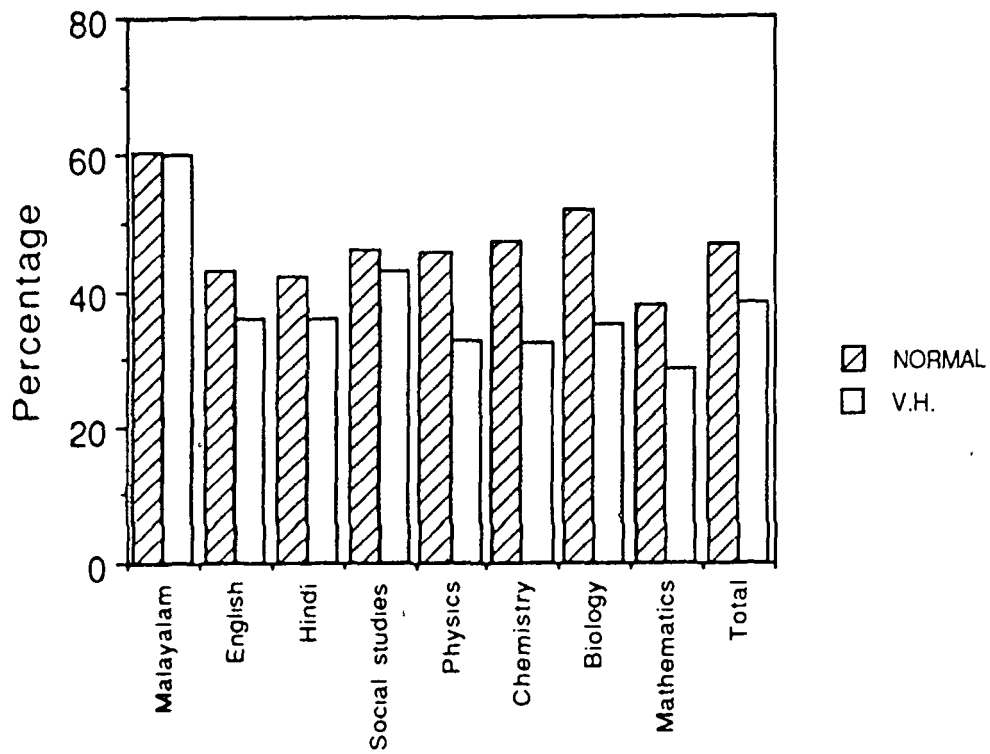


Fig.2. Histogram showing the scholastic performance of Normal and visually handicapped pupils of standard IX (unselected group).

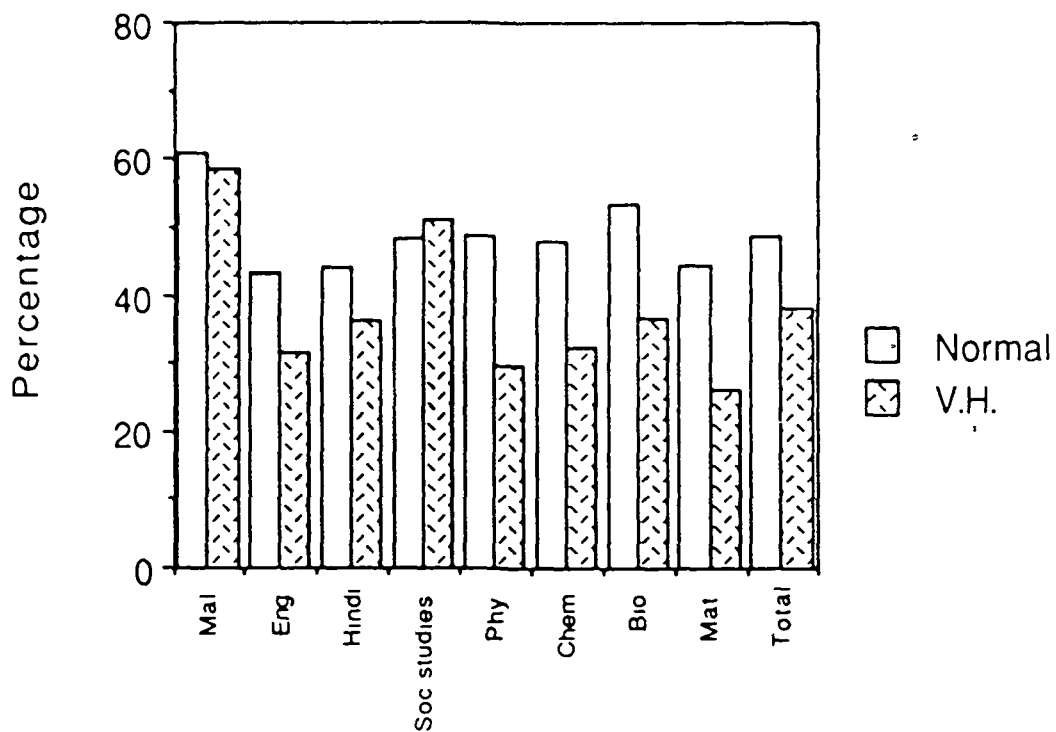


Fig.3. Histogram showing the scholastic performance of normal & visually handicapped pupils of standard X (Unselected groups).

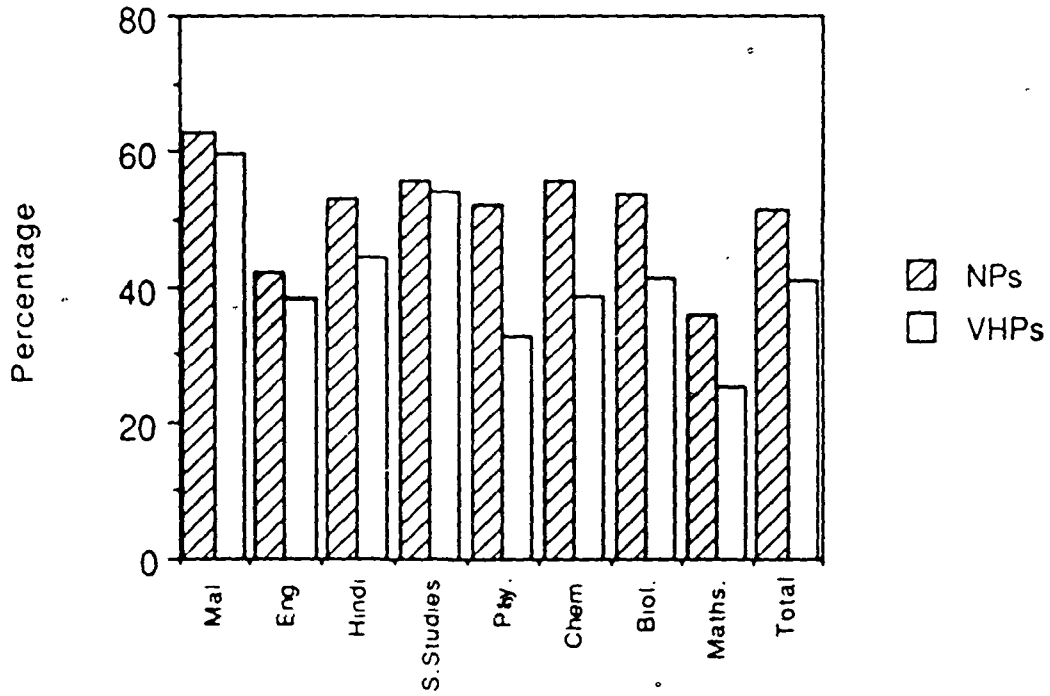


Fig.4. Histogram showing the scholastic performance of normal & visually handicapped pupils of Std. VIII (Intelligence & Socio-economic status - equated)

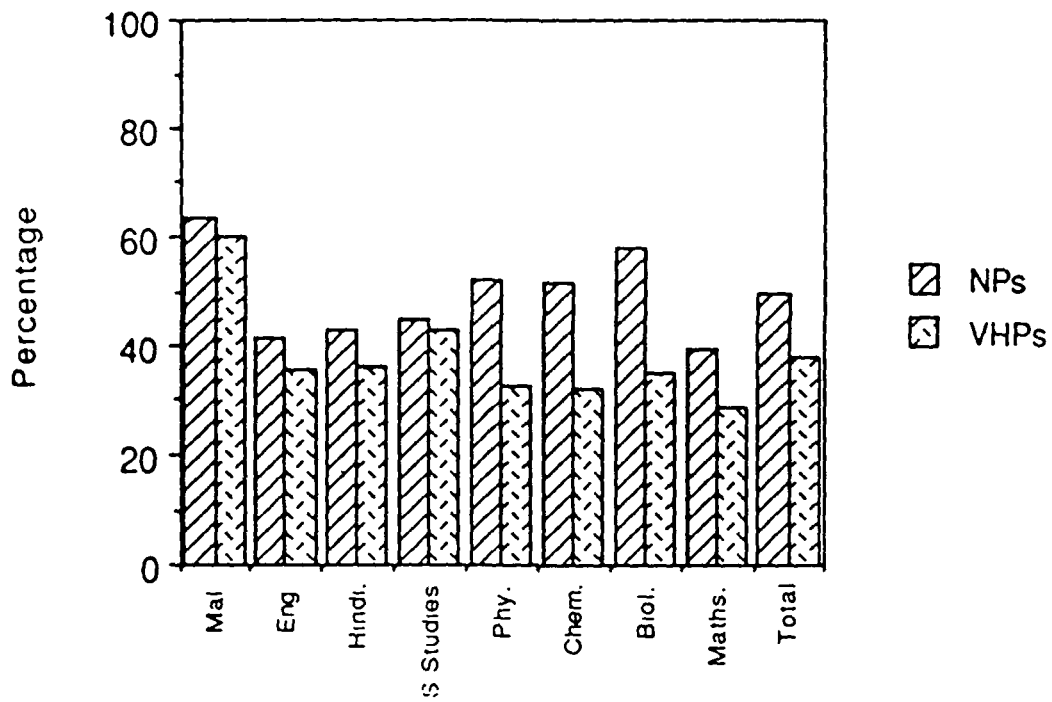


Fig.5. Histogram showing the scholastic performance of Normal & Visually handicapped pupils of standard IX. (Intelligence & Socio- economic status equated).

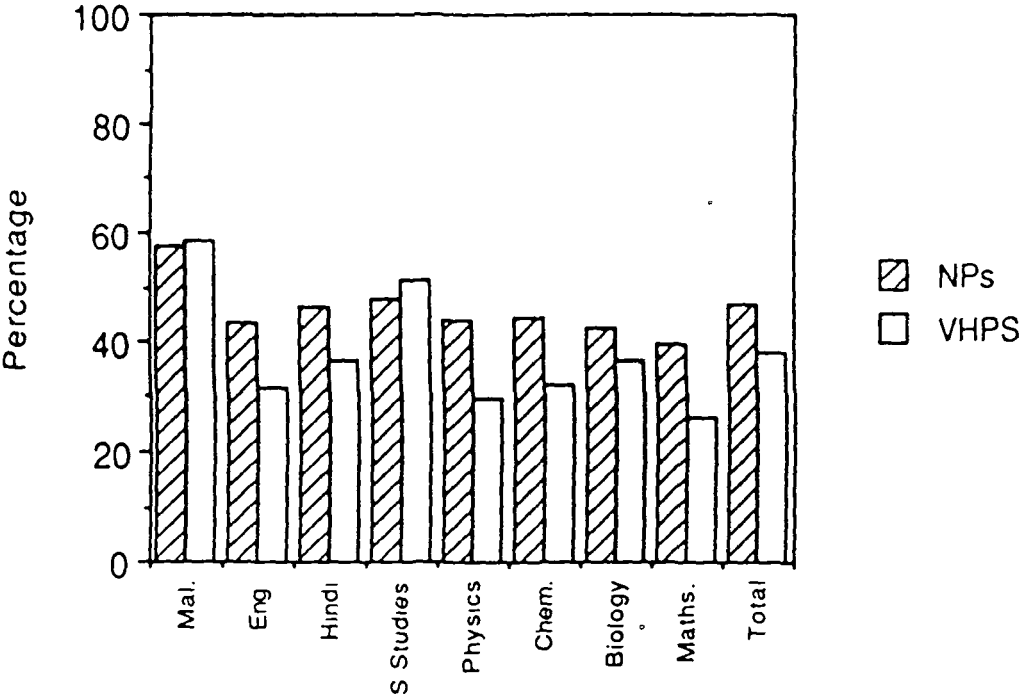


Fig.6. Histogram showing the scholastic performance of Normal & Visually handicapped pupils of standard X. (Intelligence & Socio-economic status equated).

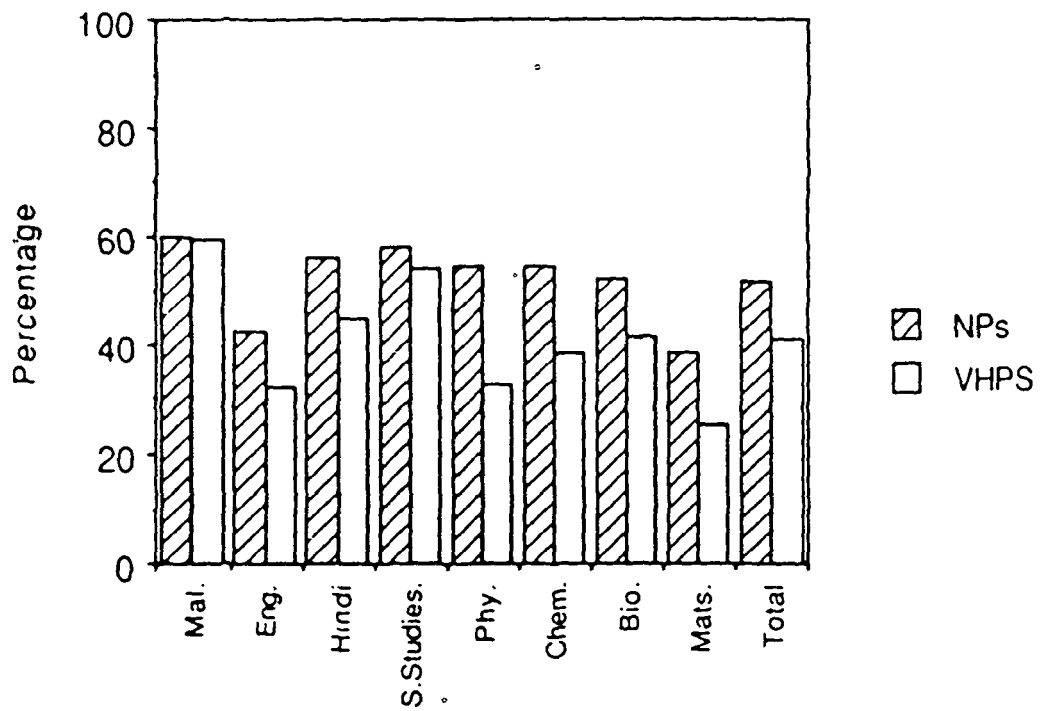


Fig.7. Histogram showing the performance of Normal and Visually handicapped pupils of standard VIII (equated for Intelligence and Socio-economic status) in three levels of cognition.

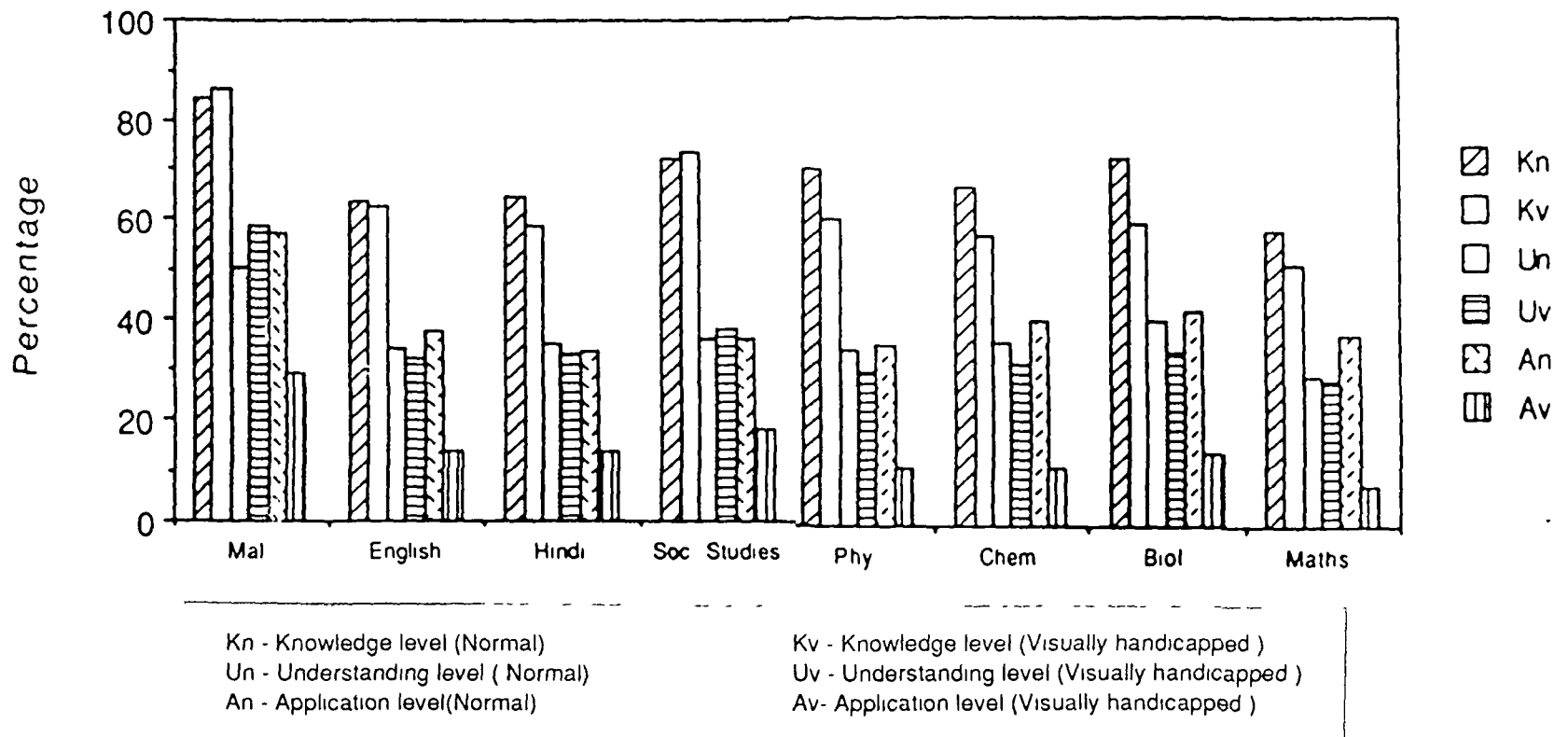


Fig.8. Histogram showing the performance of normal and visually handicapped pupils of standard IX (equated for IQ & SES) in the three levels of cognition

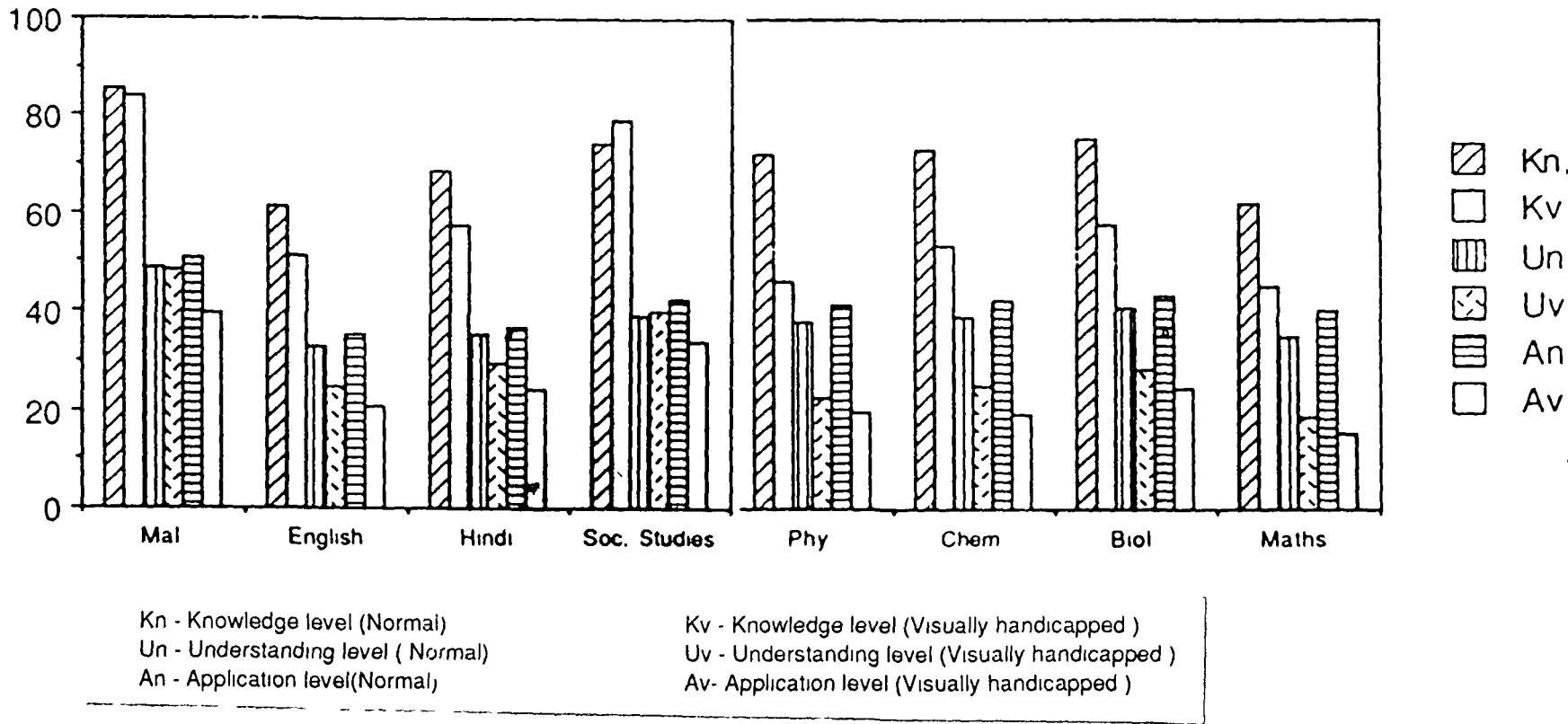
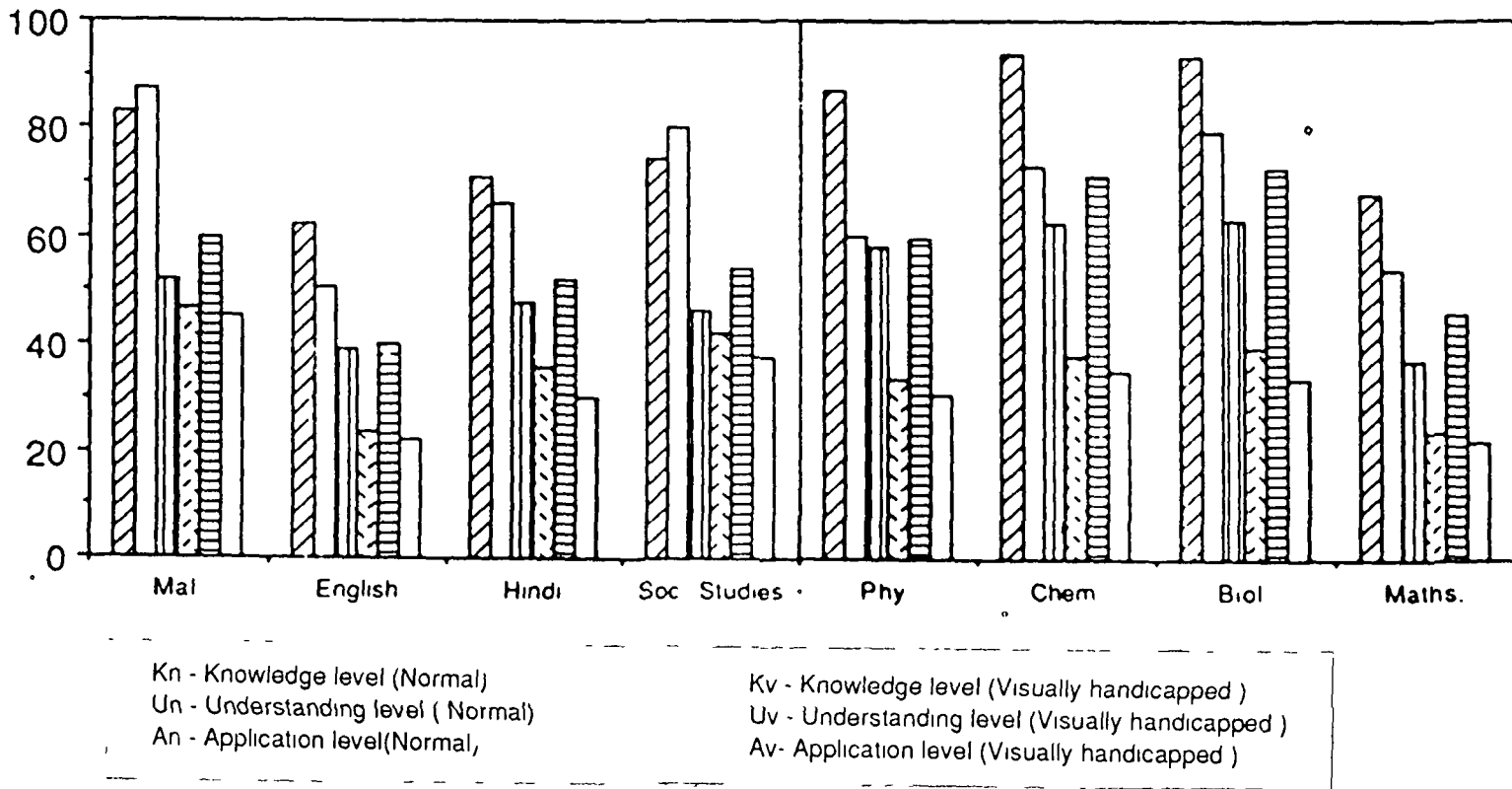


Fig.9. Histogram showing the performance of normal and visually handicapped pupils of standard X (equated for IQ & SES) in the three levels of cognition.



These figures clearly indicate the following:-

1. Generally the visually handicapped are inferior to their normal counterparts in their scholastic performance in all subjects except in a very few instances (Malayalam and Social Studies in certain cases) as well as in their total mean performance.
2. The difference is noticeable high in the case of Physics, Chemistry, Biology and Mathematics.
3. When cognitive achievement is divided into three levels, viz., Knowledge, Understanding and Application, it is obviously seen that the visually handicapped are at greater disadvantage in the level of achievement at the understanding and application levels.

CHAPTER - V

CONCLUSIONS AND SUGGESTIONS

THE STUDY IN RETROSPECT -- MAJOR FINDINGS -- TENABILITY
OF THE HYPOTHESES - SUGGESTIONS -- SUGGESTIONS FOR
FURTHER RESEARCH

CONCLUSIONS AND SUGGESTIONS

1 THE STUDY IN RETROSPECT

1.1 Restatement of the problem

As stated in earlier contexts, this study was intended to compare the scholastic performance of the visually handicapped pupils with that of the normal pupils under the Integrated System of Education in the Secondary Schools of Kerala. The problem was stated as "A Comparative Study of the Scholastic Performance of the Visually Handicapped Pupils Studying Under the Integrated System with that of the Normal Pupils, in Secondary Schools of Kerala."

1.2 Variables

(a) Independent variable

The major factor "blindness" that is expected to cause the differences in the scholastic performance of visually handicapped pupils and the normal pupils.

(b) Dependent variable

The investigation was designed with achievement in the eight subject areas of the school curriculum, and the total performance in these (expressed in scores gathered by

written tests), as dependent variables:

The dependent variables are:

- i. Achievement in Malayalam
- ii) Achievement in English
- iii) Achievement in Hindi
- iv) Achievement in Social Studies
- v) Achievement in Physics
- vi) Achievement in Chemistry
- vii) Achievement in Biology
- viii) Achievement in Mathematics
- ix) Total achievement in the eight school subjects taken together.

c) Control variables

The following variables have been used for obtaining the equated groups.

- i) Intelligence
- ii) Socio-Economic Status
- iii) Sex
- iv) Locality of residence.

1.3 Objectives and Hypotheses of the Study

The study was aimed at a comparison of the educational performance of visually handicapped pupils and normal pupils

in the integrated system in schools with a view to find whether there exists any significant difference. If differences are noticed, it was also intended to identify the major causes for such differences. Based upon this goal, the following objectives were identified. .

- 1) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 2) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 3) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating socio-economic status differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their their performance.

- 4) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence and socio-economic status, differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 5) To test whether the two groups of visually handicapped pupils and normal pupils of Standards VIII, IX and X obtained by equating intelligence, socio-economic status and sex, differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 6) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence, socio-economic status sex and locality of residence differ significantly in their scholastic performance in the eight subject areas of the school curriculum as well as in their total performance.
- 7) To test whether the two groups of visually handicapped pupils and normal pupils of standards VIII, IX and X obtained by equating intelligence and socio-economic status differ significantly in their **scholastic**

performance in the eight school subjects at each of the three levels of cognition viz., (i) Acquisition of Information (Knowledge), (ii) Understanding, (iii) Ability to apply the understanding in new situation (Application), with respect to the various subjects.

1.4 Hypotheses of the study

(a) Major hypothesis

Visually handicapped pupils and normal pupils of secondary schools differ significantly in their mean scholastic performance in various subject of study as well as in their total performance.

(b) Sub-hypotheses

- 1) Two groups of visually handicapped pupils and normal pupils of secondary schools, equated for intelligence will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total performance.
- 2) Two groups of visually handicapped pupils and normal pupils of secondary schools, equated for socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study as well

as in their total performance.

- 3) Two groups of visually handicapped pupils and normal pupils of secondary schools, equated for intelligence and socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total performance.
- 4) Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence, socio-economic status and sex will differ significantly in their mean scholastic performance in the various subjects of study, as well as in their total performance.
- 5) Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence, socio-economic status, sex and locality of residence will differ significantly in their mean scholastic performance in the various subjects of study, as well as in their total performance.
- 6) Two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence and socio-economic status will differ significantly in

their mean scholastic performance in the eight school subjects at each of the three levels of cognition, viz., 1) Acquisition of Information, (ii) Understanding, and (iii) Ability to apply the understanding in new situations with respect to the various subjects.

1.5 Procedures

The visually handicapped pupils in the schools of the state following the integrated system were identified. Out of the ten schools in Kerala belonging to that category, eight schools from which full co-operation could be obtained were selected for the study. All the visually handicapped pupils in three standards VIII, IX and X studying in these schools, were chosen for the sample. In order to get enough number of matched normal pupils while equating the four intervening variables successively, sufficiently large number of normal pupils from the same standards were included in the sample. Thus the final

sample included a total number of 95 visually handicapped and 640 normal pupils (Standard VIII, 41 visually handicapped and 266 normal pupils; Standard IX, 32 visually handicapped and 219 normal pupils and Standard X, 22 visually handicapped and 155 normal pupils).

The data for the study was collected using standardised tests for measuring the dependent variables and control variables. The control variables were measured using standardised tools readily available and the dependent variables were measured by 24 achievement tests developed and standardised by the investigator with the help of subject experts.

The data were analysed using the following techniques.

- 1) Test of significance of difference between the means of large independent samples.
- 2) Test of significance of difference between the means of small independent samples.
- 3) Test of significance of difference between the correlated means of large sample.
- 4) Test of significance of difference between the correlated means of small sample.

1.6 Major findings

In the section on analysis, the issue under investigation has been studied in a variety of ways. Thus the effect of visual handicap has been identified with respect to performance of visually handicapped pupils in the

various subjects of study as well as their total performance with respect to standards VIII, IX and X. In addition to this, in order to test whether the general findings arrived at during the initial stage of the analysis were relevant even when related intervening variables were controlled; one at a time, two at a time, etc. the analysis was extended with the necessary control of variables. Since such analyses were done for all the subjects, for all the standards and in various stages of control, a large number of conclusions could be arrived at. Further, analysis was done also to find out how far the effect of visual handicap is revealed at various levels of cognition. The findings thus arrived at have been enumerated under five sections marked A, B, C, D, E in the chapter on analysis. In order to get a comprehensive picture of these findings, a consolidated statement of findings also is attached at the end of the chapter.

However a careful study of these large number of findings has enabled the investigator to arrive at certain meaningful patterns showing the nature of the effect of independent variables on the scholastic performance of visually handicapped pupils. It is felt that listing the major findings that emerge from the analysis will be helpful

to arrive at meaningful conclusions leading to plans of action for taking remedial measures to compensate for their handicap. With this end in view, the major findings that reflect the pattern in the relationship between the independent and dependent variables are listed below:

1. The visually handicapped pupils are found to be significantly different in their scholastic performance from their normal counterparts who study along with them in the integrated system of Education.
2. This difference is noticed to be almost uniformly existing in the case of all the school subjects except Malayalam and Social Studies. In the case of these subjects, significant differences are noticed occasionally.
3. Difference in the scholastic performance is found to be in favour of the normal group indicating that visual handicap in general stands in the way of the handicapped group performing on a par with the normal group.
4. When intelligence, which is considered to be one of the most important variables contributing to scholastic performance, was controlled, it is found that the two groups are generally different. The pattern in the difference is found to be almost similar to that noticed before the

control. Whereby it is prevalent in all school subjects in all standards except Malayalam and Social Studies in certain cases.

5. When subsequently, socio-economic status which is considered to be another factor that influences scholastic performance, was controlled and the analysis made, it was still noticed that the difference in favour of the normal group persisted, the pattern being almost similar to the one described above.
6. When the control of variable was extended to sex as well as locality of residence (done in two stages) and the analysis continued, the pattern in the results has been found to remain only with slight variation here and there.
7. The analysis without control of variables and with control of variables generally indicate that the visually handicapped pupils are inferior to their normal counterparts in the scholastic performance, though in the case of two subjects viz., Malayalam and Social Studies, this is not found to be true in all cases.
8. When the scholastic performance was divided into three levels, viz., Knowledge, Understanding and Application

and comparison made between the two groups, the following trends have been noticed.

- a) All the Knowledge level in Standard VIII significant difference was noticed between the two groups only in the case of 4 subjects, viz., Physics, Chemistry, Biology and Mathematics. But at Understanding level, significant difference was noticed for all subjects except Hindi and Social Studies. In the case of Application, the difference exist in all the eight subjects of study.
- b) In standard IX the difference at the Knowledge level was noticed in all subjects except Malayalam and Social Studies. In the Understanding level the pattern remains the same and at the Application level there is significant difference in the case of all subjects.
- c) In Standard X significant difference was noticed in the case of five subjects, viz., English, Physics, Chemistry, Biology and Mathematics, both at Knowledge and Understanding levels, where at the Application level it is prevalent in the case of all the eight subjects.

9. The findings (8) generally indicate that the visual handicap experiences more disadvantages when dealing with deeper levels of cognition.
10. All the above findings strongly suggest the need for designing and executing compensatory learning experiences suited for the visually handicapped, if they are to be brought on a par with the normal pupils in the integrated system of secondary school education. It is also noted that this will be required more for attainment of deeper levels of cognition especially in the case of Mathematics, Physical Science and Biology.

2. TENABILITY OF THE HYPOTHESES

The major hypothesis states that the visually handicapped and the normal pupils of secondary schools differ significantly in their mean scholastic performance in various subjects of study as well as in their total performance.

The results of tests of significance of difference between mean achievement scores for the whole samples and sub-samples in various standards indicated that in most cases the visually handicapped and normal pupils differ

significantly with respect to their scholastic performance in English, Physics, Chemistry, Biology and Mathematics and also in the total mean scores.

In the case of subjects Malayalam and Social Studies, the two groups of pupils are found not to show any significant difference in most of the cases. Thus the hypothesis No.1 is mostly substantiated.

Sub-hypothesis No.1 states that the two groups of visually handicapped and normal pupils of secondary schools equated for intelligence will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total performance.

The results of the tests of significance of difference between mean achievement scores for the two equated groups (IQ controlled) of Standard VIII showed that there exist significant difference in the case of all subjects except social studies, whereas in standard IX, Malayalam and Social Studies do not show any significant difference.

In the case of Standard X, there exist significant differences in all the subjects except Malayalam and Social Studies.

In the light of the findings stated sub-hypothesis No.1 is mostly substantiated.

The sub-hypothesis No.2 states that the two groups of Visually handicapped and Normal pupils of secondary schools equated for Socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study as well as their total performance.

The results of the test of significance of difference between mean achievement scores for the two equated groups (socio-economic status - controlled) for the various standards VIII and IX pointed to the fact that there exist significant difference in the case of all subjects except Malayalam and Social Studies, whereas in standard X, Malayalam, Social Studies and Biology do not show any significant difference.

In the light of the findings stated, sub-hypothesis No.2 is mostly substantiated.

Sub hypothesis No.3 states that two groups of visually handicapped and normal pupils of secondary schools equated for intelligence and Socio-economic status will differ significantly in their mean scholastic performance in the various subjects of study as well as in their total performance.

The results of the tests of significance of difference

between mean achievement scores of the two equated groups (IQ and socio-economic status controlled) showed that, in standard VIII, there exist difference in all subjects except social studies whereas in Standard IX and X the difference is noticed in all the subjects, except in Malayalam and Social Studies. Thus the hypothesis No.3 is mostly validated.

Sub-hypothesis No.4 states that the two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence, socio-economic status and sex will differ significantly in their mean scholastic performance in the various subjects of study as well as in the total performance.

The results of the tests of significance of difference between mean achievement scores of the two equated groups (IQ, socio-economic status, sex controlled) indicated that in Standards VIII, IX and X there exist differences in all subjects and the total mean scores, except in Malayalam and Social Studies. Thus the hypothesis No.4 is mostly substantiated.

Hypothesis No.5 states that the two groups of visually handicapped and normal pupils of secondary schools equated for IQ, socio-economic status, sex and locality

of residence will differ significantly in the various subjects of study as well as in their total performance.

The results of tests of significance of difference between mean achievement scores of the two equated groups (IQ, socio-economic status, sex and locality of residence controlled) showed that in standards VIII and IX, there exist differences among rural boys in all subjects except in Malayalam whereas in standard X, Malayalam and Social Studies do not show significant difference. Thus the hypothesis No. 5 is mostly validated.

Sub-hypothesis No.6 states that the two groups of visually handicapped pupils and normal pupils of secondary schools equated for intelligence and socio-economic status, will differ significantly in their mean scholastic preference in the eight school subjects at each of the three levels of cognition, viz.,

- i) Knowledge (acquisition of information)
- ii). Understanding, and
- iii) Application (ability to apply the understanding in new situations with respect to the various subjects).

The results of the tests of significance of difference between cognitive levels of achievement in different schools

subjects of the two equated groups (IQ and socio-economic status controlled) of standard VIII, significant difference was noticed between the two groups in the case of four subjects viz., Physics, Chemistry, Mathematics and English. At the understanding level, significant difference is noticed for all subjects except Hindi and Social studies. But at the 'Application' level the difference exists in all eight subjects of study.

In the case of standard IX the differences at the 'Knowledge' level was noticed in all subjects except Malayalam and Social Studies. In 'Understanding' the pattern remains the same and at the 'Application' level there is significant difference in the case of all subjects.

In Standard X, significant difference was noticed in the case of five subjects viz., English, Physics, Chemistry, Biology and Mathematics both at the 'Knowledge' and 'Understanding' levels whereas at the 'Application' level it is prevalent in all the eight subjects. Thus the sub-hypothesis No.6 is mostly substantiated.

3 SUGGESTIONS

3.1 Suggestions for strategies of instructional practices

From the analyses of vast data gathered, it is evident

beyond doubt that the visually handicapped are in a disadvantageous position compared to their normal counterparts with respect to scholastic performance in general. This means that inspite of the desirability of the integrated approach, compensatory steps have to be taken for making good of the disadvantage. The practice elsewhere is to seek the help of trained personnel specialised for providing such compensatory measures. In our state, such a step is not found to be in practice. Hence it is suggested that at least one such trained personnel be appointed in each school.

Since instructions in the various subjects to both the groups are imparted by the same set of teachers, even the ordinary teacher could get familiarised with the special type of learning experiences that would be beneficial to the visually handicapped. Hence teachers of school where integrated system is in vogue, should be oriented to such compensatory measures so that they can with the co-operation of the expert teachers, help the disadvantaged groups to cope with their problems.

Since the visually handicapped cannot gain direct visual perception which is the most effective learning experience required for internalization of concepts, etc.,

other forms of experiences will have to be designed by appealing to other senses. For this purpose, special aids will be required. Hence, it is suggested that a sufficiently equipped "Resource Room" has to be set up in schools having Integrated System of Education. .

However hard the teachers may try, compensation will not be sufficient unless the visually handicapped children get emphathetic help and assistance from their normal peer group. In order to make this possible normal children studying alongwith the visually handicapped children have to be given the right kind of guidance and orientation.

Compensatory measures required for the visually handicapped cannot be restricted to the school alone. To give a large variety of experiences in the place of the visual experience denied to them, assistance of parents in particular and the society in general will be required. For example, in order to enable the visually handicapped to understand certain phenomena which could be explained to the normal group, with the help of models or diagrams, the visually handicapped will have to be taken to an on the spot exposure to the phenomena. This warrants co-operation and an emphathetic approach from the personnel, associated.

With a view to ensure such co-operation, the parents and the community have to be oriented to the importance of such services.

It has been found that more difficulty is experienced with respect to science subjects that involve learning a variety of principles, concepts and process and that too when the level of cognition is deeper. To tackle this problem careful analysis of the curricula has to be made with special reference to the requirements of the visually handicapped and learning experiences that could effectively appeal to senses like tactile, audio, gustatory and olfactory designed with care. Compensation is possible only if the special advantage of the visually handicapped group in the senses other than sight is utilized to the maximum possible. The services of the experts in this area have to be pooled together for this purpose.

Success in the frequent tests given for formative and summative evaluation is a motivating factor for further learning. It has been pointed out at the time of the informal discussion by many pupils and teachers that the visually handicapped can express themselves to the maximum possible, if they get the facility to write the examination in the braille system. Therefore wherever

possible, such facilities may be provided, which will indirectly help them to raise their level of performance.

3.2 Suggestions for further research

Certain research topics that could be taken up for study are suggested below:

1. A study may be conducted on Vocational interests of visually handicapped pupils in relation to sex, socio-economic status and locus of control.
2. Certain psychological, social and familial correlates of scholastic performance of visually handicapped pupils in Secondary schools of Kerala.
3. Mainstreaming visually handicapped pupils: An experiment.
4. Developing computer-assisted teaching technique for select subject areas for the visually handicapped children.
5. Developing and try-out of audio-model for instructions in basic language and Mathematical skills for the visually handicapped children.
6. A study of the level of aspiration of visually

handicapped pupils in relation to their age, sex and intelligence.

7. A study of the academic motivation of visually handicapped pupils in relation to their sex and socio-economic conditions.

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DEPARTMENT OF EDUCATION
UNIVERSITY OF CALICUT

- I Achievement tests in the eight curricular areas for Standard VIII
- II Achievement tests in the eight curricular areas for Standard IX
- III Achievement tests in the eight curricular areas for Standard X

Instructions

These are tests in the eight subjects viz., Malayalam English, Hindi, Social Studies, Physics, Chemistry, Biology and Mathematics. Do not write anything on these question papers. Separate score sheets are provided for you for marking answers. In the score sheet, question numbers are given in order. There are 30 questions in each test, and for each question four answers are given marked by letters, a, b, c, and d, of which only one answer is correct. Find out the correct answer to each question. Then mark it in the score sheet, against the particular question number, by putting a cross mark x in the circle below the letter, denoting the correct answer.

9. "ഘോരന സീചിയാജാലമകന്യുട-
നേര്യമനജ്ജാതെ നിന്യുപോജി" ഓര്?

(എ. ഓന്വേരി, ഐ. ഗംഗ, ഐ. ചാളിന്ദി, ഐ. പലലഴി)

10. മലയാളം രാമകൃഷ്ണമന്ദിര നവലാർ അന്വർത് നേടിക ചുടിയേഴ്?

(എ. വേരുകൾ, ഐ. അന്വർത്, ഐ. പൊന്നി, ഐ. അഴി)

11. രാമപുരമുഴു വാരുരുടെ പ്രതിഭയ ചാവു ഘേര്?

(എ. നളവരിശം അടക്കം, ഐ. ശ്രീചുഷ്ണവരിശം മതിപ്രവാളം,
ഐ. ചുടേലവുഴുശം സഞ്ചിവാടു, ഐ. പ്രരോദനം)

12. ചമരളിടുകടെ അമുദിയാരമൻ ഓര്?

(എ. അളളഴ്വോൾ, ഐ. ചുമാരതാശാൻ, ഐ. ളളളൾ, ഐ. ചെറുശ്ശേരി)

13. വഴിയെഴ് ഘേനവു ഉഷ്ടനൈട ചന്ദ്രാവിഷം.

(എ. പ്രേമം, ഐ. നാഗരിയ പ്രശ്നജ്ജൽ, ഐ. ചുടനാടൻ ചർചരുകടെ
മീമ്പിഴ പ്രശ്നജ്ജൽ, ഐ. ദുഃഖം)

14. 'ചേരളഴ്വരിയെ നാടോടി വിജ്ഞാനീയഴ്വരിനൊരു മുഖവുര' എന്ന ചുടിയുകടെ
ചർഴ്വരവു ഓര്?

(എ. അച്ചുശൻ നംപുഴിരി, ഐ. എ.സി. വിഷ്ണുനംപുഴിരി, ഐ. സി.ടി.
ഭടരിരിവാഴ്, ഐ. ചെറുശ്ശേരി നംപുഴിരി)

15. 'ചൊടിയുകടെവിജ്ഞനഴ്വരി പരവുശാഷം'. ശ്രീചുഷ്ണനൈടി അരാജിജ്ജനെ
പറയുകഴ്?

(എ. ക്ഷീരമു, ഐ. അമ്മമാൻ, ഐ. ഗോപിമമാൻ, ഐ. ഗോപൻമാൻ)

16. "ഗാനമുഖ മേമ്പിന വേനനകുടിവാകാ-
ജാനനം വന്ദിയെ ചെങ്കു പുകു." ഓര്?

(എ. സനമാല, ഐ. ചേടിനീരമു, ഐ. മീനജ്ജൽ, ഐ. മാൻ)

17. "മുദൊരു മാതാവു ചുടിയുകടെൻമ-
അനുവാഴ്ജ്ജമോടോമനൈൻ" മുദൊരു മാതാവു ഓര്?

(എ. മുദൊളി മാതാവ്, ഐ. സളർഴ്ജ്ജമു, ഐ. ജ്ജെഴ്ജ്ജി, ഐ. ചിന്ദി)

18. 'നല്ല്യ ഗ്രന്ഥശാല അന്വർത് അർസുചലാശാല വനെജാഴ്' എന്നു പറയുകഴ്
ഓര്?

(എ. ചാർവെളൽ, ഐ. മഹാഴ്മാഗാന്ധി, ഐ. ടാഗോർ, ഐ. എലിഷ്ട)

- 19. 'ഭൂമിസൂരനിയ്ക്കു ഓഴ്ച വെച്ചു' താൻ?
(എ. താഴി, ഓ. തിരുനോൽ, ഓ. മലയാളരാജ്യം, ഓ. മൂന്നി)
- 20. ഉള്ളൂരിന്റെ മതാചാര്യന്മാർ?
(എ. ഉമാമേശ്വരൻ, ഓ. തിരുവനന്തപുരം, ഓ. ശ്രീമദ്വേദാന്തം, ഓ. ചിത്രകോശം)
- 21. ജന്മപാപം നശിപ്പിക്കുവാൻ 1944-ൽ ജനമിതി നഗർ ട്രാൻസ്മിഷൻ മെമ്പർമാർ ചെയ്തപോലെ എന്തിനെ ചെയ്തത്?
(എ. സിദ്ധാർത്ഥൻ, ഓ. ഇൻഡ്യൻ ട്രാൻസ്മിഷൻ, ഓ. താഴ്മയ്ക്കൽ, ഓ. തിരുവനന്തപുരം)
- 22. മനസ്സിനെ തൃപ്തിപ്പെടുത്താൻ - മനസ്സിനു പദമാർഗ്ഗം വെക്കുക?
(എ. മനസ്സിനെ, ഓ. മനസ്സും, ഓ. മനസ്സും, ഓ. മനസ്സിനെ)
- 23. "ഇന്ത്യയിലെ സാമൂഹിക ന്യൂനതകളെക്കുറിച്ച് എന്തിനെ ന്യൂനത?" ഇതിനെ ന്യൂനത?
(എ. സാമൂഹികം, ഓ. ന്യൂനത, ഓ. മനസ്സിനെ, ഓ. ഇന്ത്യയിലെ)
- 24. "ശിഷ്യൻ ശിഷ്യൻ. ഇതിനെക്കുറിച്ച് എന്തിനെക്കുറിച്ചാണ്?" ഇതിനെക്കുറിച്ച് പദം?
(എ. സാമൂഹികം, ഓ. തിരുവനന്തപുരം, ഓ. സാമൂഹികം, ഓ. ന്യൂനത)
- 25. 'പാലക്കാട് മലയാളി മലയാളി പാലക്കാട്' - ഇതിനെ ന്യൂനത?
(എ. ഇന്ത്യയിലെ, ഓ. മലയാളം, ഓ. സാമൂഹികം, ഓ. സാമൂഹികം)
- 26. സർവ്വോപരി എന്ന പദം പിരിയപ്പെടുത്തുക?
(എ. സർവ്വോ+ഉപരി, ഓ. സർവ്വ+ഉപരി, ഓ. സർവ്വോ+ഉപരി, ഓ. സർവ്വോ+ഉപരി)
- 27. പൂർണ്ണത എന്ന പദം പിരിയപ്പെടുത്തുക.
(എ. പൂർണ്ണ+ത, ഓ. പൂർണ്ണ+ത, ഓ. പൂർണ്ണ+ത, ഓ. പൂർണ്ണ+ത)
- 28. 'മൂന്നിതരങ്ങൾ' - ഈ പദം പിരിയപ്പെടുത്തുക?
(എ. മൂന്നിതരങ്ങൾ, ഓ. മൂന്നിതരങ്ങൾ, ഓ. മൂന്നിതരങ്ങൾ, ഓ. മൂന്നിതരങ്ങൾ)
- 29. താൻ തന്നെപ്പോലെയെങ്കിലും ഇതിൽ ഇതിനെക്കുറിച്ച് പദം
(എ. സാമൂഹികം, ഓ. മലയാളം, ഓ. മലയാളം, ഓ. സാമൂഹികം)
- 30. മൂന്നിതരങ്ങൾ ഇതിനെക്കുറിച്ച്?
(എ. മൂന്നിതരങ്ങൾ, ഓ. മലയാളം, ഓ. മലയാളം, ഓ. സാമൂഹികം)

Standard VIII

ENGLISH

Time 15 Minutes

1. Who put the rag doll on Helen's Knees?
 - a. Helen herself
 - b. Mother
 - c. Anne Sullivan
 - d. Alexander Graham Bell

2. Who was the fat man with thick glasses?
 - a. Royal Wizard
 - b. Magician
 - c. Lord High Chamberlain
 - d. Royal Mathematician

3. What was the colour of the wizard's robe?
 - a. White
 - b. Brown
 - c. Blue
 - d. Pink

4. Who said the moon was made of green cheese?
 - a. Royal Wizard
 - b. Royal Mathematician
 - c. Royal Jester
 - d. Royal Musician

5. Why did the writer take corn with him?
 - a. to eat for the writer and his son
 - b. to feed the monkeys
 - c. to give to the Sadhu
 - d. to take to the flour mill

6. What kind of man was Sadhu?
 - a. Cruel
 - b. kind hearted
 - c. merry old gentleman
 - d. adventurous

7. What do the big barges contain?
 - a. yellow silken scarf
 - b. yellow butterflies
 - c. yellow leaves
 - d. yellow hay

8. Why are the birds silent in their nest? because they are
 - a. sleeping
 - b. not well
 - c. taking rest
 - d. deaf and dumb

9. Who was bald-headed and short-sighted?
a. Doctor b. Lenore's father c. Mathematician
d. Court Jester.
10. What happened to Helen-Keller in the year 1887?
a. she fell ill b. she was born
c. she was admitted in the school
d. her teacher Anne Sullivan came to her
11. Which is the capital of Portugal?
a. London b. Lisbon c. Italy d. Spain
12. To which country did Columbus belong?
a. Spain b. Portugal c. Italy d. India
13. When did Vasco da Gama land in India?
a. 1894 b. 1498 c. 1948 d. 1846
14. Which nation was more interested in an eastern sea-route?
a. England b. Spain c. Portugal d. Italy
15. What were the names of ships which Columbus took for his voyage?
a. Santa Maria, Nina, Tonka b. Santa Maria, Nina, Pinta
c. Beagle, Nina, Pinta d. Pinta, Beagle, Polaris
16. How often did the monkeys go by the road?
a. once in a day b. twice in a day
c. thrice in a day d. always
17. Sadhu had four regiments of monkeys. Which regiment troubled the writer?
a. The chota Simla platoon b. The latter Bazar platoon
c. The Sadr Bazar platoon d. The reserve platoon.
18. The oldman could not remember where he _____ his money.
a. deposite b. is depositing c. had deposited
d. with deposit.

19. He never ate much, he ate _____ food.
a. little b. very little c. a little d. a few
20. What is sugar made _____?
a. of b. up c. from d. by
21. She is very dull. She cannot understand it
(combine the sentence using 'too')
a. She is too dull to understand it.
b. She too is dull to understand it.
c. She is too dull she cannot understand it.
d. She is very dull she too cannot understand it.
22. Prices of articles increase steadily.
They are not going to _____ (using the opposite of the word under lined)
a. decrease b. unincrease c. rise d. raise
23. _____ chapters of the book are easy and interesting
a. first two b. two first c. first d. two last.
24. Who wrote the poem 'Night'?
a. Oscar Wilde b. William Blake c. William Shakespeare
d. Sarogini Naidu.
25. "I came, I saw, I conquered" Who said these famous words?
a. Helen's parents b. Helen Keller c. Anne Sullivan
d. Julius Caesar
26. The crackers _____ with a loud noise.
a. go out b. go off c. go through d. go down.

27. He cried loudly. He cried angrily (use both.... and)
- Both he cried loudly and angrily.
 - He both cried loudly and angrily.
 - He cried both loudly and angrily
 - He cried loudly and angrily both.
28. The teacher compelled him to repeat the answer
(Rewrite the sentence using make pro-noun infinitive structure)
- The teacher make him repeat the answer.
 - The teacher made him repeat the answer.
 - The teacher made him to repeat the answer.
 - The teacher made him repeated the answer.
29. We gave him an expensive present. (begin the sentence
"An expensive present ")
- An expensive present is given to him by us
 - An expensive present gave him by us.
 - An expensive present was given to him by us.
 - An expensive present has given to him by us.
30. Arun won the first prize in Science Quiz Begin the
sentence with 'It'
- It is Arun who won the first prize in Science Quiz
 - It was Arun who won the first prize in Science Quiz.
 - It is Arun who has won the first prize in Science Quiz.
 - It was Arun who has won the first prize in Science Quiz.

हिन्दी

Std. VIII
Time : 15 minutes.

1. गणेश कहीं काम करता है ?
डाक तार विभाग में, स्कूल में, रेलवे स्टेशन में ।
2. गणेश किस की तलाश करता है ?
दोस्त की, मकान की, डाक्टर की ।
3. मकान का कितने सपने होते हैं ?
दरबार, पाँच ती, तो-सौ ।
4. राघव के बड़े भाई कहीं रहते हैं ?
मदुरै में, बम्बई में, तालस्वन्तपुरम में ।
5. ज्वाहरे की छुट्टियों में नोबल कहीं जाना चाहता है ?
दिल्ली, अटो, मैसूर ।
6. जयकुमार कहीं जा रहा है ?
फॉलोज, स्कूल, पर ।
7. रेल की पटरों तक स्थान में थी ?
उखड़ी हुई थी, पूर्व स्थान में थी, देखने योग्य थी ।
8. तैक्यों लीन नौत के मुँह से क्या कहा ?
जयकुमार की भावना से, जयकुमार के भावना से ।
9. जहाँ रज मकान उतरा पैदा हो गया था कहीं ?
मैदान में, युद्ध क्षेत्र में, रेल की पटरियों में ।
10. राष्ट्रपति ने तन् 1956 में इस वीर युवक को सम्मानित किया । कैसे ?
परमवीर चक्र, अशोक चक्र, पद्मभूषण ।
11. कौन अनरोत करता है ?
मूरख, पाण्डित, काँव ।

12. भारत माता का प्रेम कैसा है ?
॥ महत्वपूर्ण है, आदर्श है, सबसे बढ़ कर है ॥
13. सबसे इसका नाता -
॥ ढीला, गहरा, अच्छा ॥
14. निम्नलिखित पानी कौन से पवित्र स्थान से संबन्धित है ?
॥ मंका, गुरुद्वार, गुस्वापूर ॥
15. किस को छाया शीतल है ?
॥ गंगाजल को, अंतस्मा को, धर्मों को ॥
16. तारा राष्ट्र किसको अपना बापू मानता है ?
॥ महात्मा गाँधीजी को, नेहरू जी को, विवेकानन्द को ॥
17. किस नाटक देखकर गाँधीजी ने सत्याग्रह का संकल्प किया ?
॥ श्रवणकुमार नाटक, सत्य हरिश्चन्द्र, श्रीरामचन्द्र जी ॥
18. किसनाटक से गाँधीजी को सेवादाता होने की प्रेरणा मिली ।
॥ भक्त कुचेल, श्रवणकुमार, वीर भारती ॥
19. भारत कब स्वतन्त्र हुआ ?
॥ अगस्त 15 1947, जनवरी 26 1950, जून 30, 1948 ॥
20. गाँधीजी को एक व्यापारी के मुकदमे की पैरवी के लिए कहाँ जाना पड़ा ?
॥ अमेरिका, दक्षिण अफ्रीका, इंग्लैंड ॥
21. अब हमारे पक्ष-पक्षिकि बने हुए हैं । क्या ?
॥ उनके महान आदर्श, उनका प्रेम, उनके सत्याग्रह ॥
22. मातृभाषा में अनुवाद करो -
॥ पानी की कीर्ति दिक्कत नहीं -
23. स्त्रीलिंग शब्द चुनकर लिखें -
पानी, दूत, किताब ।

24. सही रूप कौन-सा है? ये + ने
इन्हे, इन्होंने, इसने
25. रेखीकृत शब्द के विलोम शब्द से पूरा करो ?
पहले हम गुलाम थे। अब हम --- है।
आज़ादी, आज़ाद, आज़ाद से
26. समानार्थक शब्द कौन-सा है ?
डाका डालनेवाला - चोर, डाकू, डाकिया
27. रिक्त पंक्तियों में पूरा करो -
रंग-रंग का फूल दिखाता।
----- फैलाता।
28. 'गुलाब नामक कविता किसकी है ?
मन्नन द्विवेदी गजपुरी, मैथिली शरण गुप्त जो, सुमित्रानन्दन पन्तजो
29. महोने का नाम जोड़कर लिखो - 15-6-1950.
पन्द्रह जून उन्नीस सौ पचास
30. वहाँ एक भयानक खतरा पैदा हो गया था।
खतरा के बदले विपत्ति का प्रयोग करो।
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SOCIAL STUDIES

1. First President of United States of America:-
a) George Bush (b) Ragoon (c) George Washington
d) Abraham Lincoln
2. The founder of Arya Samaj:
a) Iswar Chandra Vidhya Sagar (b) Vivekananda
c) Sree Ramakrishna Paramahansa (d) Dhayananda Saraswati.
3. _____ was the last Mugal Emperor who ruled Delhi.
a) Akbar (b) Bahadurshah (c) Shersha (d) Aurangazeeb
4. _____ is known as the Pink city.
a) Jaipur (b) Delhi (c) Agra (d) Calcutta
5. India became republic in the year-----
a) 1947 (b) 1950 (c) 1956 (d) 1942
6. The founder of Sahodara Sangam
a) K. Ayyappan (b) Dr. Palpu (c) Kumaranasan (d) V. Karuppan
7. Kerala was formed in the year
a) 1950 (b) 1956 (c) 1920 (d) 1947
8. _____ was the portuguese who studies about the flora and fauna of Malabar
a) Robert Clive (b) Yascodagama (c) Montesque (d) Van Reede
9. The Viceroy who presented the Ilbert Bill was -----
a) Lord Canning (b) Lord Rippon (c) Lord Mount Batton
d) Lord Dalhouse
10. Who founded the 'China Revival Society'?
a) Lenin (b) Mao-Tse-Tsung (b) Dr. Sun-Yat-Sen (d) Carl Marx
11. Who was the Social reformer who worked for the upliftment of women in Andhra?
a) Iswar Chandra Vidhyasagar (b) Kumaranasan (c) Ulloor
d) Kanolukuri Veerasalingam
12. Russian revolution started in the year -----
a) 1918 (b) 1917 (c) 1857 (d) 1779
13. Where did the first war of independence of 1857 start?
a) Bengal (b) Meerut (c) Kanpur (d) Delhi

14. The Indian Constitution came into force in the year--
a) 1947 (b) 1952 (c) 1948 (d) 1950
15. _____ was first who came to India for trade
a) Dutch (b) Portuguese (c) English (d) French
16. Which is the largest Peninsular river?
a) Mahanadi (b) Godaveri (c) Krishna (d) Cavery
17. Where did the British established ~~there~~ supremacy in India first?
a) Surat (b) Madras (c) Bengal (d) Bombay
18. The most famous social reformer in Maharashtra?
a) Jothiba pula (b) Baji Roa (c) Shivaji (d) Syed Ahemed Khan
19. Which was the important revolt fought against British in Assam?
a) Khasi revolt (b) Samthal revolt (c) Mappila revolt
d) Kolsi revolt
20. In democracy rights are related to -----
a) Rights (b) Independence (c) duties (d) job
21. Another name of Theyyam
a) Kudiyattom (b) Kaliyattam (c) Tukkum (d) Kaniyarkali
22. Who established the first land mortuags bank in Travancore?
a) Sri Chithira Tirunal (b) Sri Mulam Tirunal
c) Marthanda Varma (d) Bala Rama Varma
23. In 1885became the part of British India
a) Sikkim (b) Burma (c) Buthan (d) Punjab
24. The author of the book "The Judgement".
a) Janardhanan (b) Takoor (c) Kuldeep Nayyar (d) Uma Vasudev
25. The important Portuguese Centre in Kerala was -----
a) Cochin (b) Kozhicode (c) Trivandrum (d) Anjengo
26. Which of the followings is not related to the results of Kerala contact with portuguese:
a) Introduction of Western architecture by building number of churches.

- b) Marked the beginning of western type of education in Kerala
 - c) Cheated the political unification of Kerala
 - d) Introduction of new industries like salt manufacturing and dyeing.
27. Which of the following statements is not related to the failure of the revolt of 1857?
- a) The rebel leaders had no unity,
 - b) The British army was very powerful
 - c) Indian Sepoys were unorganised
 - d) Many educated Indians were actively participated in the revolt.
28. Between 1836 and 1856 there were number of violent disturbances in 'Malabar. These out breaks are called 'the Mopla revolts', because:
- a) These revolts were lead by peasants of Malabar.
 - b) The revolts were lead by mopla peasants
 - c) The peasants rose against the imperialism
 - d) Dispossessed rulers and local chiefs gave the leadership.
29. 19th and 20th Centuries witnessed struggle for freedom and establishment of democracy due to:
- a) Nationalist ideas
 - b) The rise of Socialism
 - c) The emergence of capitalism
 - d) existence of factory system
30. Find out the factor which is not influenced to the renaissance
- a) observation
 - b) questionning
 - c) experimentation
 - d) wandering life

- 1 The motion of molecules in a solid substance is _____
((a) translational motion (b) spin motion
(c) vibrational motion (d) rotational motion)
- 2 In the high temperature matter exists only in _____
state.
((a) solid (b) liquid (c) gas (d) plasma)
- 3 The unit of thrust is _____
((a) Metre (b) Newton/metre² (c) Newton (d) Kilometre)
- 4 Laws of motion was introduced by _____
((a) Newton (b) Darwin (c) Edison (d) Bohr)
- 5 The average kinetic energy of molecules in a substance
is called _____
((a) temperature (b) heat (c) velocity (d) acceleration)
- 6 The instrument used to measure the relative density of
liquids is _____
((a) Hygrometer (b) Lactometer (c) Hydrometer
(d) Manometer)
- 7 Rate of change of velocity is called _____
((a) displacement (b) acceleration (c) Motion (d) speed)
8. The force which is acting perpendicular to the surface of
a body is called _____
((a) Thrust (b) pressure (c) gaseous pressure
(d) atmosphere pressure.)
- 9 The lowest temperature that can be theoretically
achieved is _____
((a) - 273°C (b) 0°C (c) -44°C (d) 273°C)

- 10 Velocity of light is _____ Km/Sec.
((a) 300 (b) 3000 (c) 30000 (d) 300000)
- 11 The unit which is used to express the distance between heavenly bodies is _____
((a) Lactometre (b) Metre (c) Millimetre (d) Light year)
- 12 The Scientist known as the "Father of Electricity" is _____
((a) Paraday (b) Galilio (c) Newton (d) Boyle)
- 13 The motion of needles in a watch is an example for _____ motion
((a) translational (b) vibrational (c) rotational (d) spin)
- 14 Temperature of a substance is 27°C . What is its Kelvin Scale's reading ?
((a) 300 K (b) 246 K (c) 310 K (d) 327 K)
- 15 When a body is completely or partially immersed in a liquid, the buoyancy acts equal to the _____ of the liquid displaced by the body.
((a) pressure (b) weight (c) volume (d) length)
- 16 When the heat energy increases, the _____ of molecules also increases.
((a) light energy (b) electrical energy (c) kinetic energy (d) potential energy)
- 17 The substance that is not transparent to the magnetic flux is _____
((a) glass (b) paper (c) iron (d) copper)
- 18 The rate of expansion of glass is _____ than copper.
((a) greater than (b) lower than (c) equal to (d) none of these)

- 19 A temperature below the melting point of ice can be expressed in celsius scale as _____
((a) -15°C (b) 15°C (c) 10°C (d) 5°C)
- 20 For the same force _____ will be greater on a smaller area and lesser on a larger area.
((a) thrust (b) velocity (c) pressure (d) relative density
- 21 The weight of 1 milli litre water is _____
((a) 1 Kg. (b) 1 Mtr. (c) 1 Quintal (d) 1 gm.)
- 22 With a velocity of 39.2 m/S , what is the velocity of the stone after 2 seconds ?
((a) 19.6 m/s (b) 29.4 m/s . (c) 9.8 m/s . (d) 39.2 m/s .)
- 23 A man running ~~50 metres~~ in 5 seconds. His speed is _____
((a) 250 m/s (b) 250 cm/s (c) 10 m/s (d) 10 cm/s)
- 24 Which of the following has a translatory motion ?
((a) rotation of the hands of the watch
(b) movement of a fixed pulley
(c) motion of the earth about the sun
(d) a moving bus
- 25 Plattinum wire can be sealed in glass tubes, because _____
((a) Platinum and glass have the same coefficient of expansion.
(b) The cost of platinum is low
(c) Platnum and glass have different coefficient of expansion.
(d) None of these.

- 26 Gaps are given in slabs of large concrete buildings.why ?
(a) For getting fresh air
(b) For looking beautiful
(c) Due to the high cost of slabs
(d) During hot season the slabs expand
- 27 A steel cylinder which can just slide along a hollow aluminium tube at ordinary temperature, can move more freely when there is considerable rise in temperature. This is because _____
(a) The expansion of aluminium is greater than steel
(b) The expansion of aluminium is lesser than steel
(c) Both aluminium and steel expand at a same rate
(d) Both expand quickly.
- 28 A body moves along a circular path of radius 10m and reaches the starting point itself. So the distance travelled by it is _____
((a) 62.8m (b) 31.4m (c) 10m (d) 100m)
- 29 If we are sitting in a completely closed room of a ship moving smoothly through the sea, we would not feel the state of motion because _____
((a) We are moving through the sea
(b) We are sitting in a ship
(c) We are sitting in a completely closed room of a ship
(d) None of these.
- 30 An egg sinks in fresh water but floats in salt water. Why
((a) The density of salt water is lower than fresh water
(b) The density of salt water is higher than fresh water
(c) The weight of egg in fresh water is less
(d) In salt water, the weight of egg increases.

CHEMISTRY

Time 15 Mts.

- 1 Substances made up of small identical particles are called _____
((a) molecules (b) units (c) electron (d) cells)
- 2 In an atom protons are seen
((a) In the outer shell (b) Scattered (c) Anywhere
(d) In the Nucleus)
- 3 The only element with no neutron in the nucleus is _____
((a) Hydrogen (b) Hahnium (c) Helium (d) Neon)
- 4 The number of protons in an atom is its _____
((a) atomic number (b) atomic weight
(c) number of neutrons (d) number of orbits)
- 5 Atoms having same atomic number but different mass number are known as _____
((a) Compounds (b) Isobars (c) Molecules (d) Isotopes)
- 6 An atom is electrically _____
((a) positive (b) neutral (c) negative (d) none of these)
- 7 An example of artificial fibre is _____
((a) Jute (b) Nylon (c) Cotton (d) Wool)
- 8 The chemical bond formed as a result of transfer of electrons is _____
((a) Ionic (b) Co-valent (c) Metallic
(d) None of these.)
- 9 The valency of inert gases is _____
((a) 0 (b) 2 (c) 3 (d) 1)

- 10 The Scientist who suggested a model for the structure of an atom is _____
((a) Rutherford (b) Neil Bohr (c) Dalton
(d) J.J. Thomson)
- 11 The maximum possible number of electrons that can be accommodated in the first shell of an atom is _____
((a) 2 (b) 18 (c) 8 (d) 36)
- 12 Atoms reduce the amount of energy _____
((a) to become stable (b) to become unstable
(c) to increase reactivity (d) None of these)
- 13 Which of these is a polar compound ?
((a) $MgCl_2$ (b) $NaCl$ (c) KCl (d) H_2O)
- 14 An example of chemical change is _____
((a) Burning of wood (b) Melting of ice
(c) Melting of wax (d) Vapourisation of H_2O)
- 15 The most abundant element in the earth's crust is _____
((a) Nitrogen (b) Oxygen (c) Hydrogen
(d) Carbon dioxide)
- 16 The number of electrons in an element having atomic number 4 is _____
((a) 2 (b) 4 (c) 6 (d) 8)
- 17 On heating Potassium Chlorate, we get Potassium chloride and _____
((a) Oxygen (b) Hydrogen (c) Potassium (d) Chloride)
- 18 The chemical bond in water molecule is _____
((a) Co-valent (b) Ionic (c) Metallic (d) None of these)

- 27 When bright aluminium articles are kept exposed for a long time, they become dull because
((a) A thin layer white aluminium oxide forms on the surface
(b) They get covered by moisture
(c) A thin layer carbonate is formed
(d) None of these)
- 28 Electrons in the outer most shell of an atom possess greater energy because
((a) The force of attraction between nucleus and valence electrons decreases
(b) The force of attraction between nucleus and valence electrons increases
(c) There is no force of attraction between the nucleus and valence electrons
(d) none of these)
- 29 During splitting a smaller sugar particles show
((a) Atoms other than that of sugar
(b) Atoms with properties of sugar
(c) Molecules of sugar
(d) Molecules without the properties of sugar
- 30 In an ethylene molecule the two carbon atoms are bonded by
((a) Triple bond (b) Double bond (c) Single bond
(d) Ionic bond)

- 19 An example of compound is _____
((a) Salt (b) Smoke (c) Limewater (d) Honey)
- 20 _____ is a form of matter, composed of electrically charged particles.
((a) Solids (b) Liquids (c) Gas (d) Plasma)
- 21 The branch of chemistry that deals with chemical reactions taking place in living thing is _____
((a) Polymer Chemistry (b) Physical Chemistry
(c) Organic chemistry (d) Bio chemistry)
- 22 The number of carbon atoms present in a glucose molecule is _____
((a) 2 (b) 6 (c) 8 (d) 12)
- 23 In alcohol, carbon, hydrogen and oxygen are combined in the ratio
((a) 12:22:11 (b) 2:6:1 (c) 2:4:1 (d) 2:5:2)
- 24 Metals are good conductors of electricity. Why ?
((a) Metals have many free electrons
(b) Metals have no free electrons
(c) Metals have large nucleus
(d) None of these)
- 25 The atomic number of an element is 35. What is the number of electrons in the "N" shell ?
((a) 3 (b) 18 (c) 2 (d) 7
- 26 The noble gases do not combine with other elements. Why?
((a) Because of its stable configuration
(b) They have larger atoms
(c) They have small atoms
(d) None of these.)

B I O L O G Y

Standard - VIII

Time: 15 mts.

1. Chlorophyll is present in the
a) stroma; b) grana; c) lamella; d) vacuole.
2. Chromosome number of human beings
a) 23; b) 23 pairs; c) 48; d) 46 pair.
3. Which organelle is called the 'Power House of the Cell'?
a) Lysosome; b) ribosome; c) mitochondrion; d) nucleus.
4. Cell was discovered by
a) Schleiden; b) Schwann; c) Robert Hook; d) Virshow.
5. The branch of Biology dealing with life processes is _____.
a) Physiology; b) Anatomy; c) Morphology; d) Cytology.
6. Which is the largest gland of the human body?
a) Salivary gland; b) gastric gland;
c) Pituitary gland; d) liver.
7. Plants living in water are called
a) xerophytes; b) hydrophytes; c) mesophytes;
d) epiphytes.
8. A mammel living in water
a) crocodile; b) turtle; c) whale; d) fish.
9. Plasma membrane is _____ membrane.
a) impermiable; b) semipermiable; c) fully permiable.
10. The non-living part of a plant cell is the
a) cytoplasm; b) Nucleus; c) cell wall; d) Nucleolus
11. In the alimentary canal proteins are digested into
a) glucose; b) amino acids; c) fatty acids; d) glycerol.

12. The plane of cell division is determined by
a) Ribosome; b) Lysosome; c) Centrosome; d) Chromosome.
13. Golgi bodies are abundant in _____ cells.
a) muscle; b) gland; c) nerve; d) blood.
14. Milk is coagulated by the enzyme.
a) Pepsin; b) Renin; c) Lipase; d) Ptyalin.
15. Virchow stated that cells originate from
a) dead cells; b) non-living things; c) other cells;
d) vacuum.
16. Jaundice is a disease connected with
a) heart; b) lungs; c) liver; d) brain.
17. Enzymes are absent in _____
a) saliva; b) bile; c) gastric juice; d) pancreatic
juice.
18. Lysosomes are abundant in
a) white blood cells; b) red blood cells;
c) thrombocytes; d) plasma.
19. Food in the stomach turns acidic due to the mixing of
_____ with it.
a) nitric acid; b) hydrochloric acid; c) citric acid
d) acetic acid.
20. Glycerol is absorbed into the _____ of the villi
a) lymph; b) blood; c) plasma; d) serum.
21. Which nitrogen base is absent in RNA?
a) uracil; b) adenine; c) guanine; d) thymine.
22. The most important process in respiration
a) intake of O_2 ; b) release of CO_2 ;
c) storage of energy; d) release of energy.

23. The source of reducing agent for photosynthesis is
a) CO₂; b) water; c) chlorophyll; d) minerals.
24. A person coughed while eating. What may be the reason?
a) food entered into the larynx;
b) food entered into the oesophagus;
c) food entered into the nostrils;
d) food eaten was hot.
25. Eramel of tooth
a) fixes the root in socket;
b) protects the crown from damage;
c) protects the root from damage;
d) covers the pulp canty.
26. The colour change in banana on ripening is due to
a) chloroplast changed to chromoplast;
b) chromoplast changed to chloroplast;
c) Leucoplast changed to chromoplast;
d) leucoplast changed to chloroplast.
27. On piercing a lemon with a needle, an acidic fluid oozes out from
a) cytoplasm; b) plastids; c) vacuoles; d) nucleus.
28. Which peculiarity of the oesophagus helps the food that we eat to reach the stomach even in the lying position?
a) churning; b) peristalsis; c) contraction;
d) digestion.
29. As a result of Mitosis, the daughter cells resemble the parent cell in all respects because
a) nucleus divides equally;
b) chromosomes divide into two equal halves;
c) chromosomes divide equally after duplication;
d) cytoplasm divides equally.
30. Absorption of digested food takes place in the small intestine due to the presence of
a) enzymes; b) muscles; c) villi; d) digestive juice.

M A T H E M A T I C S

Standard - VIII

Time: 15 mts.

1. If $A = \{1\}$, what is the number of subsets of A?
a) 8; b) 1; c) 4; d) 3.
2. Which of the following indicates the null set?
a) \emptyset ; b) \mathbb{Q} ; c) 0; d) \mathbb{Q} .
3. One of the angles of a triangle is 110° . What is the sum of the measures of the other two angles of the triangle?
a) 55° ; b) 70° ; c) 110° ; d) 90° .
4. The total number of proper subsets of $\{5, 7, 9\}$ is
a) 8; b) 7; c) 6; d) 5.
5. If $U = \{1, 2, 3, 4, 5\}$ and $A = \{2, 3, 5\}$ Then the complement of A =
a) $\{1, 4\}$; b) ; c) $\{2, 3, 5\}$; d) $\{1, 2, 3, 4, 5\}$
6. Which of the following account is not paid any interest by nationalised bank?
a) S.B. Account; b) F.D. Account; c) Current Account,
d) R.D. Account.
7. Which of the following set of numbers is not in proportion?
a) 10, 14, 15, 21; b) 12, 11, 3, 47; c) 5, 9, 10, 18;
d) 3, 11, 9, 33.
8. If $A = \{0, 1, 2\}$ $B = \{0, 2, 3\}$ what is $A \cup B$?
a) $\{0, 2\}$; b) $\{0, 1, 2, 3\}$; c) $\{1\}$; d) $\{3\}$.
9. If $A = \{x/x \text{ is a natural number, } n < 10\}$ what is the number of element in A?
a) 7 ; b) 8 ; c) 9 ; d) 10 .

10. The measure of an angle is $(90-a)$ what is the measure of its complement?
 a) a ; b) $90+a$; c) 90 ; d) $90-a$.
11. If $A = \{x/x \text{ is } O \text{ letter in the word Malayalam}\}$ what is the cardinality of the set A?
 a) 2 ; b) 6; c) 9; d) 4.
12. What is the measure of an acute angle of an isosceles right triangle?
 a) 30 ; b) 45 ; c) 60 ; d) 90 .
13. Which of the following is true?
 a) $1 \in \{1,2,3\}$; c) $2 \notin \{1,2,3\}$; c) $1,2 \in \{1,2,3\}$;
 d) $0 \in \{1,2,3\}$
14. If P and Q are disjoint sets and if $n(P)=?$ $n(Q)=5$ then the $n(P \cup Q)$ is _____.
 a) 2; b) 7; c) 12; d) 35.
15. Which of the following is a set?
 a) The group of eleven student in your school.
 b) The group of all girls in your school.
 c) The good persons in your locality.
 d) The collection of most interesting books in the library of your school.
16. $A = \{x/x \text{ is a multiple of 3 between 3 and 18}\}$ which of the following is false?
 a) $6 \in A$; b) $9 \in A$; c) $15 \in A$; d) $18 \in A$.
17. If $a:b=3:4$ which of the following statements is not true
 a) $3b=4a$; b) $a=\frac{3}{4}b$; c) $\frac{a}{b}=\frac{3}{4}$; d) $3a=4b$.
18. The number of subsets of a set is 4. What is the cardinality of the set?
 a) 2; b) 1; c) 4; d) 0.

19. Which of the following has 3 elements?
- Set of factors of 6;
 - Set of factors of 3;
 - Set of factors of 16;
 - Set of factors of 25.
20. If $A \cup B = 8$, which of the following is false?
- $A=B$;
 - $A=Q$;
 - $A \subset B$;
 - $B \subset A$.
21. Which of the following is a singleton set?
- x/x is a prime number, 23×29 .
 - x/x is a natural number, $x = 1$
 - x/x is a natural number $x+7=3$
 - x/x is not a positive number, x is not a negative number.
22. $M(A) = 4$ $N(B) = 5$ $N(A \cap B) = 2$ $M(A \cup B) = \underline{\hspace{2cm}}$.
- 7;
 - 9;
 - 1;
 - 20.
23. If M and N are disjoint sets, which of the following is false?
- $M - N = M$;
 - $N - M = N$;
 - $M \cup N = M$;
 - $M \cap N = 9$.
24. If $\frac{A}{3} = \frac{B}{4}$, then $A:B = \underline{\hspace{2cm}}$.
- 4:3;
 - $\frac{1}{3} : \frac{1}{4}$;
 - 8:6;
 - 3:4.
25. How long will be the food required for 400 soldiers for 40 days last for 500 soldiers?
- $\frac{500 \times 40}{400}$;
 - $\frac{400 \times 500}{40}$;
 - $\frac{400 \times 40}{500}$;
 - $\frac{400 \times 40}{100}$
26. If the interest for a rupee for a month is 2 paise what is the rate of interest?
- 24%;
 - 12%;
 - 2%;
 - 20%.
27. When Rs.20/- shares are sold at Rs.10/- above par, What is the number of shares that can be brought with Rs.600/-?
- 20;
 - 10;
 - 30;
 - 60.

28. When shares are sold of $\text{Rs.}10/-$ below par, a man invested $\text{Rs.}480/-$ and bought 12 shares, what is the face value of shares, what is the face value of a share?
- a) 48; b) 40; c) 30; d) 50.
29. Out of 100 pupils who appeared for an examination
- 52 passed in Mathematics, 50 passed in English, and 30 passed in both the subjects. How many pupils failed in both?
- a) 28; b) 30; c) 22; d) 20.
30. $X:Y:Z = 5:6:7$, if $Y = 42$ what is the value of X ?
- a) $A=B$; b) $A=C$; c) $A B$; d) BCA .

- 10. "ജപ്തൻ കൊടുപ്പിപ്പോരുക കൊടുപ്പം കൊന്നം മക്കൻ നേർക്കുടമയ്ക്കുവീട്ടു". ഞാൻ? (പരമേശ്വരൻ, ശ്രീരാമൻ, വിനായകൻ, ശിവൻ)
- 11. മൂടിക്കാടൻ തിടർപ്പിടുകൾപ്പി നീക്കുവാൻ? (അമ്പലമുക്ക്, മൂടുകോഴി, വറാൻ, പെരുമതി)
- 12. പൂർപ്പൻ തിടർപ്പിടുകൾ നീക്കു പഠിപ്പിപ്പൻ? (ലോകേശ്വരൻ, ഗാനം, ശുഭ്രി, തിന്നം)
- 13. നല്ലപ്പൻ തിടർപ്പിടുകൾ ഒരു പെരുമതിയാൽ. (അമ്പലമുക്ക്, മന്ദിരമന്ദിരം, നീരപ്പൻ, ഉപ്പി)
- 14. 'ഞാൻ' എന്ന പെരുമതിയാൽ അർത്ഥം? (അമ്പലമുക്ക്, നൂപലമുക്ക്, പ്രസന്നമുക്ക്, അമ്പലമുക്ക്)
- 15. 'അമ്പലമുക്ക്' എന്ന പെരുമതിയാൽ 'ഞാൻ' എന്ന പെരുമതിയാൽ അർത്ഥം? (അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്)
- 16. മ.പി. മേൽമേൽമേൽമേൽ അർത്ഥം. (മേൽമേൽമേൽ, മേൽമേൽമേൽ, മേൽമേൽമേൽ)
- 17. 'അമ്പലമുക്ക്' എന്ന പെരുമതിയാൽ 'ഞാൻ' എന്ന പെരുമതിയാൽ - ഇതിനെ പഠിപ്പിപ്പൻ? (അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്)
- 18. ഇതിനെ പഠിപ്പിപ്പൻ അർത്ഥം? (അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്)
- 19. മൂടിക്കാടൻ പെരുമതിയാൽ അർത്ഥം? (അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്)
- 20. ഗാനമേൽമേൽമേൽ എന്ന പെരുമതിയാൽ അർത്ഥം? (അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്, അമ്പലമുക്ക്)

- 21. **കുമാരനാശാനൻറെ അദ്വൈത മതം എന്താണ്?**
(നീലപുസ്തകം, ലീല, നളിനീ, ദുരന്തം)
- 22. **പ്രത്യേകം - പിരിയപ്പിച്ചുകൊടുക്കുക**
(പ്രതി+പ്രദം, പ്രതി+പ്രദം, പ്രതി+പ്രദം, പ്ര+പ്രദം)
- 23. **പദപരിഭാഷണം - തിരിച്ചറിയുക?**
(നടപ്പുകാരൻ, പ്രവാസൻ, പ്രദേശൻ, പാലാൻ)
- 24. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 25. **ഉടൻ തിരിച്ചറിയുക**
പദപരിഭാഷണം നൽകുക
പദപരിഭാഷണം നൽകുക
പദപരിഭാഷണം നൽകുക
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 26. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 27. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 28. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 29. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)
- 30. **പദപരിഭാഷണം നൽകുക**
(പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം, പദപരിഭാഷണം)

ENGLISH

1. _____ gave Gandhiji a fairly hardy constitution
 - a. long walks
 - b. gymnastics
 - c. exercise
 - d. good good

2. Gandhiji lost one year at school because
 - a. of his marriage
 - b. of his illness
 - c. he was lazy
 - d. he was arrogant

3. The main reason for Gandhiji's dislike of Gymnastics was _____
 - a. his shyness
 - b. his keen desire to nurse his father
 - c. his wrong thinking
 - d. his hatred towards the gymnastics teacher.

4. She _____ told me about it (put in the correct self form)

5. Schatz looked ill because he was suffering from
 - a. flu
 - b. typhoid
 - c. pneumonia
 - d. head ache

6. When did the children shout with joy and clap their hands?
 - a. when the braverman took a loaded gun
 - b. when they saw the bird of paradise
 - c. when the bird fell dead ill the sun
 - d. when the grown up people threw away the bird

7. Why did the Head master fine Gandhiji?
 - a. He told a lie
 - b. He got low marks.
 - c. He was absent for the gymnastic class
 - d. He disobeyed the teachers.

8. Why did schatz lie still staring at the foot of the bed?
- He was afraid that he would die soon
 - He could not walk
 - The doctor advised him to take complete rest
 - He wanted to spend the idle
9. Who will guard the lives of the fishermen at the sea?
- The sea god
 - The sea gull
 - The clouds
 - The waves
10. What was Mary asked to do?
- To call the cattle home
 - To bring the goat
 - To fetch water
 - To collect grass for the cattle
11. When Gandhiji was in South Africa he was ashamed of himself and repented for _____
- smoking
 - stealing
 - meat eating
 - bad handwriting
12. Gandhiji had to pay a fine for not attending the gymnastics when he was in _____
- 4th standard
 - 5th standard
 - 6th standard
 - 7th standard
13. Schatz father stopped reading aloud because
- he was tired
 - he found the story boring
 - he found that schatz was not listening
 - it was time for giving medicine to Schatz.
14. In the Farenheit scale the normal body temperature _____
- 37°
 - 98°
 - 100°
 - 110°

15. I wasn't too worried about all this. What was Owens not too worried about?
- The summer in Berlin
 - The Games
 - Hitler and his master race theory
 - His performance
16. The boy's worry was due to his
- misunderstanding
 - ignorance
 - knowledge of French
 - trust in the doctor
17. Scatz did not let anyone come into his room because
- He was angry with his parents
 - He did not want any one to see him in that condition
 - He did not want to cause suffering to others
 - He did not want anyone to see him die
18. Nightingale of India
- M.S. Subba Lakshmi
 - Sarojini Naidu
 - Indira Gandhi
 - Annie Besant
19. What was Hitler's theory?
- that the Aryans are better at long jump than all others
 - that the Aryans are the best sportsmen in the world
 - that the Aryans are a superior race
 - that the Aryans are stronger.
20. As Gandhiji was honest so all the people respected him (correct the sentence)
21. He has finished, _____ (Add appropriate question tag)
22. An _____ athlete is an athlete who will make mistakes
- happy
 - unhappy
 - idle
 - angry
23. Nazi Movement is related to _____
- Mussolini
 - George Bush
 - Hitler.
24. River Brown is _____
- Ganges
 - Nile
 - Rine
 - Thames

25. In which year Berlin olympics was held?
a. 1926 b. 1936 c. 1946 d. 1992
26. To which country did Luz Long belong?
a. America b. France c. Italy d. Germany
27. The founder of the modern olympic games is _____
a. Adolf Hitler b. Luz Long
c. Jessie Owens d. Pierre de Coubertin
28. I prefer to walk rather than go by an auto (use would rather)
29. The mason is building a wall (Begin the sentence with 'the wall')
30. I request you to open the door (Begin the sentence with would).

हिन्दी

Std. IX
Time : 15 minutes

1. दूकानदार कहता है "हमारे यहाँ चाफो वेराइटी मिलेगी" । किसलिए ?
 { सच्चा के लिए, कपडे के लिए, किताब के लिए }
2. इसमें दो तीन -- आते हैं ।
 { गेड, पोती, कुर्ता }
3. यहाँ मोल तौल नहीं होता है । क्योंकि ---
 { भाल अच्छा है, शानके अन्दर हर मीटर पर कोमत छपी है, सरकार शुल्क नहीं देता । }
4. मरीज़ कहता है कि तारे शरीर में --- होता है।
 { बुखार, रंग, दर्द }
5. डाक्टर कहता है कि चार दिन को ---- दे रहा हूँ ।
 { दवा, खाना, पानी }
6. किस्तों फूल लगा है ?
 { मरीज़ को, डाक्टर को, बच्चे को }
7. वीरबल --- के दरबार के विद्वान थे ।
 { अशोक के, शाहजहाँ के, अकबर बादशाह के }
8. ब्राह्मण को फैलो भर-भोहरे इनाम देने का कहता है । कौन ?
 { मन्त्री, अकबर, वीरबल }
9. कौन खचडी पका रहा है ?
 { अकबर, वीरबल, दरबारी }
10. कबीर दास के गुरु कौन थे ?
 { रामानन्द, शंकराचार्य, रामकृष्ण परमहंस }
11. किसके संबन्ध में जीवन पुस्तक और अनुभव मार्ग निर्देशक कहता है ?
 { कबीर दास, गाँधीजी, नेहरूजी }

12. कहा जाता है कि कबीर दास सन्यास ग्रहण नहीं किया था । क्यों ?
१ साधु का ता जीवन बिताते थे, शादी न की थी, अच्छा कपड़ा पहनते थे
13. कबीर --- के कट्टर विरोधी थे ।
१ मूर्तिपूजा, खेल-कूद, धर्मविश्वास १
14. सुभद्राकुमारी चौहान ने युवा काल का जीवन --- माना है ।
१ बहुत ही कठिन, दुःखपूर्ण, खूब अनराला १
15. गणतंत्र दिवस के पर्व पर प्रत्येक भारतीय को देश की स्वतंत्रता को --- की दृष्टिप्रतिज्ञा करनी चाहिए ।
१ अधुण्ड रखने की, तोड डालने की, दान देने की १
16. गणतंत्र राष्ट्र को शासन के लिए --- स्वीकार करना चाहिए ।
१ संविधान, नीति, सेना १
17. नए संविधान के ज़ुतार भारत के सभी नागरिकों को --- का अधिकार प्राप्त है।
१ समानता, शासन करने, भाषण देने का १
18. राष्ट्रपति भवन के नामने राजपथ पर --- का आयोजन होता है ।
१ कार्यक्रम का, आकर्षक परे, जुलूस १
19. देश भर में यह पर्व बड़े उत्साह के साथ मनमया जाता है । क्योंकि --
१ हमें बहुत पतंद है, उत गदन की याद करने ने, कितने ही भारतीयों के बालदानों को कथा जुटी हुई है ।
20. बार-बार आती है मुझको --- बचपन तेरी
१ मधुर याद, सौन्दर्य, तस्वीर १
21. पिताजी ने एक बात कहा -- शुद्ध करो ।
१ पिताजी ने एक बात कही, पिताजी एक बात कहा ।
पिताजी एक बात कहे । १
22. मैं घर से आता हूँ । -- तत्कालीन वर्तमान काल में बदलो ?
१ मैं घर से आता था । मैं घर से आ रहा हूँ । मैं घर से आया हूँ

23. मैं उनका विवाह हुआ । -- विवाह के बदल शादी का प्रयोग करो ।
॥ उसका शादी हुआ । उसके शादी हुआ । उसकी शादी हुई ॥
24. मेरे घर में बैल नहीं है । मेरे घर में गाय नहीं है । "ना... ना"
योजक से वाक्य को मिलाओ ।
॥ मेरे घर में ना बैल है न गाय । मेरे घर में न बैल और गाय है ।
मेरे घर में न बैल न गाय नहीं है ॥
25. मैं ने कहा । "कहा के बदले "बोल" का प्रयोग करो ।
॥ मैं ने बोला । मैं बोला । मुझ को बोला ॥
26. मैं + के -- मिलकर ठीक स्थ कौन सा है ?
॥ मेरे, मुझके, मैं के ॥
27. स्त्री लिंग शब्द चुनकर लिखो --
॥ किताब, पानी, घर ॥
28. किस के बीच बहस हुई ?
॥ माता और पिता के बीच में, अध्यापक और विद्यार्थी के बीच में,
भाग्य और बुद्धि के बीच में ॥
29. गडरिया पेड के नीचे बैठे क्या कर रहा था ?
॥ पढ़ रहा था, सो रहा था, बाँसुरी बजा रहा था ॥
30. एक बार जब राजा ने गहनों की गिनती ली तो मालूम हुआ -- कम
पड़ती है ।
॥ एक कंगन, एक अँगूठी, एक हार । ॥
-

SOCIAL STUDIES

Standard IX

Time: 15 Minutes

1. Who was the first to give the idea of republic to the world?
 - a. Romans
 - b. Chinese
 - c. Greek
 - d. Italy
2. Who found out the concrete and the technique to combine stone and brick is _____
 - a. Romans
 - b. Greeks
 - c. Harappan
 - d. Egyptians
3. The occupation of Aryans
 - a. Cattle rearing
 - b. Priesthood.
 - c. Ruling
 - d. Warrior
4. It is presumed that in _____ second 16 million ton of water is evaporated as water vapour from the land surface to the atmosphere.
 - a. 1
 - b. 10
 - c. 50
 - d. 59.8
5. Which of the following does not related to new stone age.
 - a. Weaving
 - b. Wheel
 - c. Bow
 - d. pottery
6. Who didn't question the authority of veda and caste system.
 - a. Gandhiji
 - b. Ambedkar
 - c. Budha
 - d. Mahavera.
7. The peculiarity of _____ civilisation was the ability to make the paper.
 - a. Chinese
 - b. Harappan.
 - c. Mesopotamians
 - d. Egyptian.
8. The people who gave the bows and arrows was _____
 - a. New stone age
 - b. Old stone age
 - c. Metal age.
 - d. None of these.

9. Which is the abundant element in the atmosphere?
a. Nitrogen b. Oxygen c. Argone d. Carobonoioxide
10. The sphere on earth that included all the continents and oceans.
a. Hydrosphere. b. Lithosphere c. Biosphere
d. Atmosphere
11. Through education any high position can be obtained to ordinary man is the sociality of _____ civilization
a. Chinese b. Egyptian c. Mesopotomians
d. Greek
12. Which of the following is not directly related to the word paper.
a. Hieroglyphic. b. Papyrus c. Cureiform.
d. Picture letters.
13. Historians gave importance to _____ evolution.
a. Physical b. Organic c. Cultural
d. None of these.
14. Fossils are seen in:-
a. Magma b. Lithosphere c. Biosphere d. core
15. Which one does not belong to physical environment.
a. earth b. water c. air
d. Plants and animals
16. Which is the water current in the following.
a. Jupiter b. cloud c. rain d. storm
17. Which is related to long distant radio transmission.
a. Ironosphere b. Thermosphere c. Hetrosphere
d. Mesosphere.

18. Why did christ was crusified?

- a. Advice the people to lead a better life.
- b. Oppose the selfishness and bribe of the officials and priests.
- c. His simple life and magnetic personality
- d. His outstanding love and compassion for all

19. Why did the metal age is called the Bronze age?

- a. Because bronze is a metal
- b. Bronze is harder than copper
- c. Articles made of bronze are made in abundant
- d. None of these.

20. Why did earth is called a watery planet?

- a. Water in the earth is seen in liquid, solid, gas.
- b. About 71% of the earth is covered by water.
- c. Water is seen in inside and the surfaces of the earth
- d. Rainfall is heavy.

21. The energy sources that does not pollute the environment.

- a. Sunlight
- b. Petrol
- c. Coal
- d. Diesel

22. What is the main reason for heating the atmosphere.

- a. Conduction.
- b. convection
- c. terrestrial radiation
- d. adiction

23. The peculiarity of all the ancient civilization is _____

- a. All the civilizations formed in river valley
- b. All the civilizations are not formed in river valleys
- c. All of them formed in the Asian continent
- d. None of these

24. Which is not related to Troposphere in the following?

- a. Ozone
- b. cloud
- c. rain
- d. storm.

25. The slogan given by environmental study
- To maintain ecological balance
 - To exploit the natural resources
 - To change the environment according to one's need
 - To maintain the diversity in environment
26. A fossil fuel
- Coal
 - petrol
 - kerozene
 - solar energy
27. The first reason for the settled life of man is _____
- agriculture
 - climate
 - treat of wild animals
 - shelter
28. Excavations helps us to _____
- To study the present history
 - To study the past history
 - To study the bronze age
 - None of these
29. Why did the cloudy days are more hotter than the clear days?
- When height increases the temperature decreases in the atmosphere
 - When height increases the temperature increases
 - Oxygen is converted to ozone due to chemical changes
 - Due to green house effect
30. Why do we call Ozones as a protective covering of the Earth?
- Dangerous ultra violet rays are absorbed.
 - Ultra Violet rays are reflects by Ozone layer
 - To regulate the temperature of earth
 - Ozone is converted to oxygen

PHYSICS

STD IX

Time 15 Mts.

- 1 A liquid that exhibits capillary depression is _____
((a) Mercury (b) Petrol (c) Kerosene (d) Water)
- 2 A example of a mobile liquid is _____
((a) Kerosene (b) Castor Oil (c) Glycerine (d) Honey)
- 3 Third law of motion refers to _____ .
((a) inertia (b) acceleration (c) Reaction
(d) Momentum)
- 4 The product of mass and velocity is called _____
((a) impulse (b) impulsive force (c) momentum
(d) kilogram metre)
- 5 The branch of Physics that deals with the motion of
bodies is known as _____
((a) Biophysics (b) Geophysics (c) Mechanics
(d) None of these)
- 6 The force of attraction between similar molecules is
known as _____
((a) adhesion (b) cohesion (c) elastic (d) impulsive)
- 7 The energy possessed by a body by virtue of its
position is known as _____
((a) Kinetic energy (b) Nuclear energy
(c) Potential energy (d) None of these)
- 8 The unit used for expressing momentum is _____
((a) Kilogram (b) Kilogram metre (c) Kilogram
metre/second (d) Newton metre)

- 9 The impulse of a force is the product of _____
((a) mass x velocity (b) mass x time
(c) mass x change of velocity (d) mass x acceleration)
- 10 The acceleration due to gravity at moon is _____
((a) equal to earth (b) very large that of the earth
(c) $\frac{1}{6}$ th that of the earth (d) $\frac{1}{5}$ th that of the earth)
- 11 When temperature decreases viscosity _____
((a) increases (b) decreases (c) remains the same
(d) None of these)
- 12 When the masses of two bodies are doubled the force
between them becomes _____ times the original value.
((a) 2 (b) 4 (c) 8 (d) 16)
- 13 Momentum of a body is measured as the product of the
mass of the body and its _____
((a) Speed (b) Velocity (c) acceleration (d) Weight)
- 14 The gravitational force on a body will be _____ at
the centre of the earth.
((a) equal to that on the surface of earth
(b) equal to zero (c) greater than that of the surface
of the earth (d) slightly smaller than that of the
surface of the earth)
- 15 Which of the following is not a function of force ?
((a) It starts motion (b) It slows down motion
(c) It increases velocity (d) It varies mass)
- 16 1 Kg wt = _____
((a) 9.8 Kg. (b) 1 Kg. (c) 9.8 N. (d) IN.

- 17 When the distance between two bodies increases, the force between them _____
((a) increases (b) decreases (c) does not change
(d) none of these)
- 18 When soap is added to water, the surface tension of water _____
((a) increases (b) decreases (c) remains constant
(d) none of these)
- 19 The Greek Philosopher who believed that heavier bodies would fall faster than lighter ones is _____
((a) Aristotle (b) Edison (c) Galelio (d) Plank)
- 20 When the diameter of the capillary tube decreases, the capillary rise _____
((a) increases (b) decreases (c) remains the same
(d) none of these.)
- 21 The minimum force required to lift a body is 98 N. Then the mass of the body will be _____ Kg.
((a) 1 (b) 9.8 (c) 10 (d) 98
- 22 It is easier to catch a tennis ball as compared to a cricket ball moving with the same velocity because _____
((a) the tennis ball applies less force
(b) the cricket ball applies less force
(c) the momentum of tennis ball is less than the momentum of cricket ball
(d) the momentum of cricket ball is less than the momentum of tennis ball.)

23. Calculate the acceleration produced on a body of mass 20 Kg. when a force of 200 N acts upon it.
((a) 100 m/s^2 (b) 10 m/s^2 (c) 20 m/s^2 (d) 50 m/s^2)
24. If two bodies of different masses are dropped from the top of a tower _____
((a) the heavier body will reach the ground first
(b) the lighter body will reach the ground first
(c) the two bodies will reach the ground simultaneously
(d) none of these)
25. A car travels 72 Km in 2 hrs. What is its speed ?
((a) 36 Km/hr. (b) 36 Cm/hr. (c) 36 M/hr. (d) 360 Km/hr.)
26. In Kerosene lamps, kerosene goes up through the wicks due to _____
((a) viscosity (b) capillaryty (c) gravitational force
(d) elasticity of the wicks)
27. Rocket propulsion is an application of _____
((a) Newton's third law of motion (b) Impulse
(c) Momentum (d) Newton's First law of motion)
28. The furniture in your room remains in their respective places due to _____
((a) elastic force (b) surface tension (c) friction
(d) gravity)
29. You are trying to push a car forward but it does not move. Which of the following statement is wrong?
((a) Force is applied (b) Work is done
(c) No acceleration is produced (d) none of these)
30. A fan continues to rotate for some time even when the current is switched off due to _____
((a) Inertia (b) Force (c) Momentum (d) Friction)

1. The maximum number of orbitals that can be accommodated in the 'L' shell is
a. 8 b. 6 c. 4 d. 2
2. The shell which is not present in the 'P' orbital is
a. K b. M c. L d. N
3. The element which has the smallest atom is
a. Na b. H₂ c. Ni d. He
4. The unit which is used to represent the number of atoms in a molecule is
a. Avacadro number b. Mole c. 6.023×10^{23}
d. none of these
5. The shape of 'S' sub shell is
a. Cumbell b. spherical c. rectanoular
d. triangular
6. The element having the lowest atomic number among zero group elements is
a. Helium b. Neon c. Argon d. Krypton
7. Electron is looked upon as a cloud of negative charge according to
a. wave theory b. particle theory c. dual nature theory
d. wave mechanics
8. The quantity of the substance equal to its molecular mass expressed in grams is called its
a. gram-atom b. molar volum c. gram mole
d. equivalent mass.

9. As we proceed from group I to group VII along any period _____ increases
- a. size of atom b. metallic property
c. electro negativity d. reactivity
10. The attempt to classify the elements as triads was made by
a. Lavoisier b. Dobereiner. c. Newlands
d. Lothar Meyer
11. The number of molecules present in one gram molecular volume of any gas will be
a. 22.4 b. 6.023×10^{23} c. 6.0×10^{23}
d. 1 mole
12. The number of orbitals present in 5f subshell is
a. five b. seven c. ten d. fourteen
13. The weight of 6.023×10^{23} water molecule is
a. 2 gm b. 18 gm c. 9 gm d. 4.5 gm
14. The element which is not belonged to the first group of the periodic table is
a. Li b. Be c. He d. C
15. The element having electronic configuration $1s^2, 2s^2, 2p^6, 3s^2$ belongs to the _____ group
a. fourth b. second c. third d. seventh
16. The solution left after when sodium react with water is
a. NaOH b. KOH c. NH_4OH d. Na_2CO_3

17. The number of electrons in the last sub shell of an element having atomic number 5 is a
a. 1 b. 2 c. 3 d. 5
18. Which of the following is not similar to the other?
a. Iodine b. sodium c. bromine d. chlorine
19. The periods in which transition elements do not occur are
a. the first and the second b. the sixth and the seventh.
c. the first; the second and the seventh
d. the first; the second and the third
20. As the size of the atom increases the electronegativity
a. increases b. decreases c. no change
d. none of these
21. Electrons of 3rd orbitals have more energy than the electrons of _____ orbitals
a. 4s b. 4d c. 4p d. 2d
22. If 10 litres of hydrogen and 10 litres of oxygen are mixed together and allowed to react forming H_2O , the volume of steam produced will be
a. 10 litre b. 1 litre c. 5 litre d. 2 litre
23. The number of atoms present in 2g of hydrogen is
a. $2 \times 6.023 \times 10^{23}$ b. $2 \times 6.023 \times 10^{23}$
c. $2 \times 6.023 \times 10^{-23}$ d. none of these
24. The solution left behind when potassium has reacted with water has the properties of
a. acids b. alkalies c. base d. none of these

25. Which of the following elements does not assume +2 oxidation states in compounds ?
a. Sodium b. Iron c. Magnesium d. Zinc
26. The oxidation state of nitrogen in nitric acid is .
a. +3 b. -5 c. +2 d. +5
27. When sodium and chlorine react, chlorine atom becomes
a. Cl^- by losing one electron
b. Cl^+ by accepting one electron
c. Cl^- by accepting one electron
d. Cl^+ by losing one electron
28. Which of the following statements regarding Mandeleev's periodic table is not correct?
a. it had 7 periods b. the transition elements were not included
c. elements were divided into 8 groups in it
d. certain places were left vacant
29. What is the mass of 3 moles of bromine? (Atomic mass of Br = 80)
a. 3×80 b. 2×80 c. 3×160 d. 2×160
30. How many CO_2 molecules are present in 22 g carbon dioxide?
a. $\frac{22}{44} \times 6.023 \times 10^{23}$ b. $22 \times 6.023 \times 10^{23}$
c. $\frac{22}{44} \times 6.023 \times 10^{23}$ d. $22 \times 6.023 \times 10^{23}$

APPENDIX 15

B I O L O G Y

Standard - IX

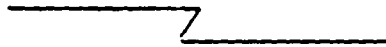
Time: 15 mts.

1. The chromosome number of human beings is
a) 23; b) 46; c) 48; d) 16.
2. In man, fertilization takes place in the _____.
a) uterus; b) ovary; c) fallopian tube; d) amnion.
3. The net work of capillaries in the Bowman's capsule is called _____.
a) pelvis; b) capsular space; c) renal tubule;
d) glomerulus.
4. The normal body temperature of man is
a) 27°C; b) 37°C; c) 98°C; d) 35°C.
5. ADH is secreted by
a) Adrenal gland; b) Pituitary gland;
c) Pancreas; d) Sebaceous gland.
6. Who is the father of Genetics?
a) Gregor Mendel; b) Robert Hook;
c) Charles Darwin; d) Schawnn.
7. Functional unit of the kidney
a) neuron; b) pelvis; c) capillary; d) nephron.
8. Wort is caused by
a) Bacteria; b) virus; c) tungus; d) plasmodium.
9. Which is the hereditary materials?
a) ATP; b) ADP; c) DNA; d) Amino acid.
10. Which one of the following reproduces by budding?
a) Hydra; b) bacteria; c) planaria; d) spirogyra.

11. Which bacterium is used for checking water pollution caused by oil spill?
a) super bug; b) coccus; c) Bacillus; d) spirilla.
12. A paddy developed in Mankombu Research Centre
a) Annapoorna; b) Karthika; c) Aswathi; d) Thriveni.
13. 'Margarin' is produced from
a) Rice; b) Wheat; c) Maize; d) Ragi.
14. A hormone developed by Genetic engineering
a) insulin; b) thyroxin; c) growth hormone;
d) somatostatin.
15. Planaria reproduces asexually by
a) binary fission; b) fragmentation; c) budding
d) regeneration.
16. The dividing tissue at the growing regions of plant body is
a) chlorenchyma; b) paranchyma; c) meristem;
d) secondary tissue.
17. Which one of the following is a growth inhibitory hormone?
a) Auxin; b) Gytokinin; c) Gibberlin; d) Ethylene.
18. Excess urination is a symptom of _____
a) diabetis insipidus; b) diabetis mellitus;
c) nephritis; d) jaundice.
19. The excretory system that excretes waste products through the alimentary canal is _____
a) nephridia; b) contractile vacuole; c) Malpighian tubule, d) kidney.
20. In identical twins, there is
a) no difference in sex; b) difference in sex;
c) no similarity.

21. Reabsorption of _____ takes place in the renal tubule from the glomerular filtrate.
- a) urea and uric acid; b) glucose and urea;
 - c) urea and salts; d) glucose, amino acids & water.
22. Although CO_2 is an excretory product, why is its presence in blood essential?
- a) to regulate osmotic pressure;
 - b) to maintain acid-base balance;
 - c) to regulate metabolism;
 - d) to regulate expiration.
23. Water always enters into the body of amoeba because
- a) Amoeba is unicellular;
 - b) water concentration in amoeba is low;
 - c) salt concentration in amoeba is low;
 - d) water concentration in the surrounding is low.
24. The necessity of producing NH_3 in human body is
- a) to remove CO_2 ; b) to produce urea;
 - c) due to the inability in storing amino acids;
 - d) due to the inability in storing nitrogen.
25. Deficiency of ADH
- a) causes diabetes mellitus;
 - b) disrupts water reabsorption;
 - c) causes uremia; d) causes renal cholic.
26. The 'After birth' eliminated during delivery is
- a) amnion; b) uterus; c) umbilical cord;
 - d) placenta and umbilical cord.
27. An artificial synthetic hormone used by horticulturist for stimulating plant growth
- a) hortomone; b) indole- acetic acid; c) gibberlin;
 - d) abseic acid.

28. Defect in the contractile vacuole of amoeba
- a) makes movement impossible;
 - b) disrupts only water regulation;
 - c) disrupts water regulation and excretion;
 - d) disrupts nutrition.
29. When the umbilical cord is cut, neither the mother nor the child experiences pain because
- a) it is a cut at a distance from both their body;
 - b) of the absence of muscles in the umbilical cord;
 - c) of the absence of nerves in the umbilical cord;
 - d) the umbilical cord is too long.
30. When a plant bearing red flowers was crossed with a plant bearing white flowers, all red flowering plants were obtained because
- a) red colour is dominant;
 - b) red colour is recessive;
 - c) white colour is dominant;
 - d) both red and white are dominant.



M A T H E M A T I C S

Standard - IX

Time: 15 mrs.

1. Which of the following is not true?
a) $0+0=0$; b) $0 \times 0=0$; c) $0 \div 0=0$; d) $0-0=0$.
2. State the property used in $-2(3+8)=-2 \times 3 + -2 \times 8$.
a) Commutative property of addition
b) commutative property of multiplication
c) associative property of multiplication
d) multiplication distributed over addition.
3. What is the multiplicative inverse of $-5\frac{1}{2}$?
a) $-\frac{11}{2}$; b) $\frac{-2}{11}$; c) $\frac{11}{2}$; d) $\frac{2}{11}$
4. Which of the following is an undefined term?
a) angle; b) circle; c) point; d) ray.
5. Which of the following has not additive increase other than itself?
a) 2; b) 0; c) -5; d) $\frac{3}{4}$.
6. In $\triangle ABC$, $\angle A \neq \angle B \neq \angle C$, what is the most suitable name of $\triangle ABC$
a) Right triangle; b) Scalene triangle;
c) Equilateral triangle, d) Isosceles triangle.
7. Which of the following has not multiplicative increase?
a) 1; b) 0; c) $\frac{2}{3}$; c) -1.
8. If $A \cap B = Q$, which of the following is false?
a) $A - B = A$; b) $A - B = Q$; c) $A \cup B = B$; d) $B - A = Q$.
9. AB and CD intersect at O. If $\angle AOC = 70^\circ$, what is the measure of $\angle BOD$?
a) 70° ; b) 110° ; c) 20° ; d) 50° .

10. $A = \{2, 5, 9\}$ $B = \{1, 5, 8\}$ which is not an element of $A \times B$?
 a) 2,5; b) 5,5; c) 9,8; d) 8,9.
11. If A and B are disjoint sets, which of the following is false?
 a) $A \cup B = A$; b) $A \cap B = \emptyset$; c) $A - B = A$; d) $B - A = B$.
12. If P and Q are the singleton sets, then the number of elements of $P \times Q$ is _____
 a) 1; b) 2; c) 3; d) 4.
13. In $\triangle DEF$, $DE = DF$, $\angle D = 80^\circ$, $\angle E =$ _____.
 a) 30° ; b) 70° ; c) 80° ; d) 50° .
14. Which of the following is irrational number?
 a) $1\frac{1}{2}$; b) 0.35; c) 3.6; d) .0016.
15. ABCD is a parallelogram. The diagonals AC and BD intersect at 'O'. If the length of OA is 7 CM, what is the length of AC.
 a) 3.5; b) 14 cm.; c) 28 cm.; d) 7 cm.
16. Which of the following when converted into its decimal form is non-terminating?
 a) $1/3$; b) $1/4$; c) $3/5$; d) $3/8$.
17. $\triangle PQR \cong \triangle XYZ$; If $\angle X = 70^\circ$, $\angle R = 80^\circ$ Then $\angle Y =$ _____.
 a) 30° ; b) 50° ; c) 70° ; d) 80° .
18. If $(m, n-3) + (n, 0)$ what is the value of 'M'?
 a) 3; b) -3; c) 0; d) 4.
19. The number of elements in $A \times B$ is 10 which of the following cannot be the value of $M(A)$ or $N(B)$?
 a) 1; b) 2; c) 5; d) 3.
20. If $P = \{1, 2, 3, 4\}$ and $Q = \{3, 5, 7, 9\}$ then $\{(P \times Q) \cap (Q \times P)\}$
 a) $\{(3, 5), (3, 3)\}$ b) $\{(5, 3), (5, 4), (3, 3)\}$
 c) $\{(3, 3)\}$ d) $\{(4, 3), (3, 3)\}$

21. The number of element in AXA is 16 which of the following is the number of element in A?
a) 4; b) 6; c) 8; d) 2.
22. $A = \{1, 2, 3\}$ $B = \{1, 2, 3, \dots, 20\}$
 $R = \{(x, y) / x \in A, y \in B, y = x^2 + 1\}$
 Which of the following is an ordered pair in R?
 a) (1, 3); b) (2, 3); c) (3, 10); d) (3, 9).
23. $\angle AOB$ and $\angle BOC$ are linear pairs. The measure of $\angle AOB$ is _____
 a) 60; b) 120; c) 80; d) 50.
24. In $\triangle ABC$, $\angle A = 2\angle C$, $\angle B = 3\angle C$, what is the measure of $\angle A$?
 a) 30; b) 60; c) 90; d) 120.
25. In the Rhombus ABCD, $AB = AC$, what is the measure of $\angle ABC$?
 a) 120; b) 90; c) 60; d) 30.
26. $P = \{1, 2, 3\}$ $Q = \{0, 8\}$ Arelatom $R = \{(x, y) / x \in P, y \in Q, y = x^2 - 1\}$ what is its range?
 a) $\{0, 8\}$; b) $\{1, 3\}$; c) $\{1, 2, 3\}$; d) $\{2, 8\}$.
27. If $A = \{0, 1, 2\}$ and $B = \{1, 6, 7\}$ and a relation from A to B is given $R = \{(1, 1), (2, 7)\}$, the then relation in the set builder form is _____?
 a) $\{(x, y) / x \in A, y \in B, y = 2x - 1\}$
 b) $\{(x, y) / x \in A, y \in B, y = x^2 - 1\}$
 c) $\{(x, y) / x \in A, y \in B, y = 4x - 2\}$
 d) $\{(x, y) / x \in A, y \in B, y = 6x - 5\}$
28. In $\triangle ABC$, $AB = AC$. D is a point on BC such that $\angle BDA = 80$ and $\angle CAD = 25$, calculate the measure of $\angle DAB$?
 a) 55; b) 100; c) 80; d) 45.
29. $A = \{-1, 0, 1, 2\}$, $B = \{0, 1, 2, 4\}$ and a relation R from A to B is given $\{\log(x, y) / x \in A, y \in B, y = x + 2\}$ relation in the Raster form is _____.
 a) $\{(-1, 1), (0, 2)\}$; b) $\{(-1, 1), (0, 2), (2, 2)\}$;
 c) $\{(-1, 1), (0, 2), (2, 4)\}$; d) $\{(0, 2), (2, 4)\}$

30. If $P = \{1, 2, 3\}$ $Q = \{0, 8\}$ relation $R = \{(x, y) / x \in P, y \in Q, y = x^2 - 1\}$ which of the following is its domain?
- a) $\{1, 3\}$; b) $\{1, 2\}$; c) $\{2, 3\}$; d) $\{1, 2, 3\}$.



മരണാളം

മുദ്രകൾ : 10

സമയം : 15 മിനുട്ട്

1. ഗാന്ധിജിയുടെ അഭിമതങ്ങൾ?
(എൻറ മതം, എൻറ അധ്യക്ഷന പരിഷ്കരണം, അധ്യക്ഷനകൾ, ഗാന്ധി അഭിമതം)
2. അർത്ഥ പ്രത്യയം വൈകാരികതയുടെ പദങ്ങൾ. എന്തിനാൽ?
(അർത്ഥശാസ്ത്രങ്ങൾ, യുദ്ധശാസ്ത്രം, ശുഭരത്നശാസ്ത്രം, ദർശനശാസ്ത്രങ്ങൾ)
3. 'ഗാന്ധിജിയുടെ' അർത്ഥം?
(അധ്യക്ഷന, മതം, അധ്യക്ഷന, അധ്യക്ഷന)
4. 'മുദ്രകൾ' എന്നൊരു അർത്ഥം നൽകി. എന്തിന് വെർണ്ണങ്ങൾ?
(മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ, മുദ്രകൾ)
5. അധ്യക്ഷനകൾ നൽകിയിട്ടുള്ളതൊന്നും ഉൾപ്പെടുത്തിയിട്ടുള്ളതൊന്നും. എന്തിന്?
(അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ)
6. അധ്യക്ഷനകൾ എന്നൊരു അർത്ഥം നൽകി. എന്തിന്?
(അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ)
7. മുദ്രകൾ നൽകി. അധ്യക്ഷനകൾ എന്തിന്?
(അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ)
8. അധ്യക്ഷനകൾ എന്നൊരു അർത്ഥം നൽകി.
(അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ)
9. "അധ്യക്ഷനകൾ" എന്നൊരു അർത്ഥം നൽകി.
(അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ, അധ്യക്ഷനകൾ)

- 10. ഹംഘം ദമജനീദിഗെല ടോഴിമാരുകി നീന്തി അടയിടേ?

(ടോഴിമാറനെ പേടിപ്പിച്ച്, ദമജനീദിഗെല ചളിപ്പിക്കാൻ, ഘോഷമടയാൽ
 തന്നെപ്പോലെയ്ക്കുമാറ്റിയിടാൻ, ദമജനീദിഗെലെ നടുവേണം വാണാൻ)
- 11. ചെറുചെറിയവർക്കു താൽപരമായ പ്രകൃതി ഘോഷം?

(മൽസ്യബന്ധനത്തിലും, നാട്യപ്രകാരം, വാക്പ്രതിമ മൂലം,
 അപമാനമേറ്റാൽ)
- 12. തദ്ദേശവാസികൾ പരിചരിക്കുന്നവർക്കു നേരിട്ടുവന്ന ഘോഷം. ഘോഷം ചെറിയ
 (മത്സ്യമെടുക്കൽ, അപമാനം, അപമാനം, മേലേ പാലിയിടം)
- 13. ചെറുചെറിയവർക്കു നേരിട്ടുവന്ന ഘോഷം?

(തദ്ദേശവാസികൾക്കു നേരിട്ടുവന്ന ഘോഷം, തദ്ദേശവാസികൾക്കു നേരിട്ടുവന്ന
 മത്സ്യമെടുക്കൽ, മത്സ്യമെടുക്കൽ, മത്സ്യമെടുക്കൽ)
- 14. ചെറുചെറിയവർക്കു നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(അപമാനം നേരിട്ടുവന്ന ഘോഷം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 15. നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മി. ന്യൂനമർ, മനോഹരൻ നേരിട്ടുവന്ന ഘോഷം, മേലേ പാലിയിടം,
 മി. മേലേ പാലിയിടം)
- 16. 'മേലേ പാലിയിടം' നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 17. "ഈ മേലേ പാലിയിടം നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 18. മേലേ പാലിയിടം നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 19. മേലേ പാലിയിടം നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 20. മേലേ പാലിയിടം നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)
- 21. മേലേ പാലിയിടം നേരിട്ടുവന്ന ഘോഷം നേരിട്ടുവന്ന ഘോഷം?

(മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം, മേലേ പാലിയിടം,
 മേലേ പാലിയിടം, മേലേ പാലിയിടം)

22. സന്ധ്യ+ഘല്ല്യ = സന്ധ്യല്ല്യ. ഇതിന്റെ അർത്ഥം?

(ദ്വൈതം, അന്വേതം, അന്യം, ലോപം)

23. തന്മാത്രാകരം എന്ന പദം പരിച്ഛേദം ആണ്.

(അന്വ+ഉച്ഛിന്നം, അന്വ+അർത്ഥം, തന്മാത്ര+ഉച്ഛിന്നം, തന്മാത്ര+അർത്ഥം)

24. 'പരിച്ഛേദം' എന്ന പ്രത്യയത്തിൽ ഏതു വിഭാഗത്തിന് അർത്ഥം ഉണ്ടാകുന്നു?

(തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിൽനിന്നുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം)

25. അന്വയം എന്ന പദം പരിച്ഛേദം?

(അന്വ+അന്വയം, അന്വ+അന്വയം, അന്വ+അന്വയം, അന്വ+അന്വയം)

26. 'ഔടീ' എന്ന പദം പ്രതിബന്ധത്തിൽ ഉപയോഗിച്ചിട്ടുള്ളത് ഏത് അർത്ഥമാണ്?

(തിരസ്കരണത്തിൽനിന്നുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം)

27. മിഥ്യയെന്നത് - അർത്ഥമാണ്?

(തിരസ്കരണത്തിൽനിന്നുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം, തിരസ്കരണത്തിലുള്ള പരിച്ഛേദം)

28. അന്വയത്തിൽ - ഈ പദം വിഭാഗത്തിൽ?

(അന്വയം, അന്വയം, അന്വയം, അന്വയം)

29. അന്വയത്തിൽ പ്രതിബന്ധം?

(അന്വയം, അന്വയം, അന്വയം, അന്വയം)

30. 'അന്വയം' - വിഭാഗത്തിൽ?

(അന്വയത്തിൽനിന്നുള്ള പരിച്ഛേദം, അന്വയത്തിലുള്ള പരിച്ഛേദം, അന്വയത്തിലുള്ള പരിച്ഛേദം, അന്വയത്തിലുള്ള പരിച്ഛേദം)

APPENDIX 18

E N G L I S H

Standard - X

Time: 15 mts.

1. The analyst reported that the contains of the tins _____.
a) cocaine; b) face powder; c) gun powder; d) Opium.
2. _____ symasthised with Booker in his studies.
a) friends; b) mother; c) teachers; d) father.
3. M.K. Gandhi _____ in 1948.
a) pass by; b) passed off; c) passed away;
d) passed for.
4. Daffodils excels the waves in their _____.
a) playing; b) dancing; c) sweeping; d) beauty.
5. Rocolle was a _____.
a) Miser; b) spent thirft; c) robber; d) smuggler.
6. In the poem up hill resting place means _____.
a) Hotel; b) Inn; c) Heaven; d) Hostel.
7. I am a boy. (Turn into question tag)
a) aren't I? b) aren't he? c) Isn't he? d) are I?
8. Roculle would not hear of it. What?
a) to throw the powder out; b) to buy cocaine;
c) the report of analyst; d) to put the cocaine into
face powder.
9. He does not like tea (turn into past tense)
a) He did like tea; b) He did not liked tea;
c) He did not like tea; d) He do not like tea.
10. Who is the hero in the story Christmas morning?
a) Adam; b) Robbert; c) Mary; d) Robbert's mother.

11. "Don't break your pledge this is my work I shall not fail" who said to whom.
- a) Krishna to Bhishma; b) Krishna to Arjuna;
c) Arjuna to Krishna; d) Arjuna to Bima.
12. "I will do every thing barring these two" said Bhishma to Duryodhana. What are these two?
- a) to fight with Sikhandin and Dandava
b) fighting against Krishna.
c) fighting against Sikhandin
d) fighting against Sikhandin and Pandavas.
13. The old man was half frantic between greed and fear. Which won at the end?
- a) Fear; b) greed; c) fear and greed; d) kind and fear.
14. I would advise you to buy the ticket now. (use had better)
- a) I advise you had better to buy the ticket now.
b) You had better buy the ticket now.
c) You had better bought the ticket now.
d) You had better buy the ticket then.
15. It was Robert's habits to wake up at _____.
- a) 6 clock; b) 7 clock; c) 5 clock; d) 4 clock.
16. He _____ smoking.
- a) gave up; b) gave in; c) gave over; d) gave out.
17. Whom can a traveller meet at the inn?
- a) inn keeper; b) God; c) women; d) other travellers.
18. He is very weak. He cannot walk. (Use too - to)
- a) He is too weak. He to walk.
b) He is too weak to walk
c) He is too weak not to walk.
d) He is too weak he is to walk.
19. I happened to meet an old friend of mine at Calicut. (use the suitable phrase underlined sentence)
- a) came across; b) come across; c) call off
d) passed away.

20. Who put 4000 frames to the scheme?
a) Jew; b) miser; c) Pole; d) Analyst.
21. "Despite the disappointment however, I determined that I would learn something, anyway" what trait of Booker's character does it reveal?
a) shyness; b) disappointment; c) happy; d) courage.
22. "It is not worth while perhaps". Who said this.
a) Robert; b) His mother; c) His wife; d) His grand-uncle.
23. Who was the narrator of the story "The Miser".
a) Rosseti; b) Orwell; c) Wordsworth; d) Jeromice Seron.
24. Booker's second difficulty was with regards his _____
a) Parents; b) work; c) Name; d) father.
25. Ten thousand rupees _____ not a big amount.
a) are; b) is; c) were; d) have.
26. Correct the following:
Ravi go to Calicut yesterday.
a) Ravi going to Calicut yesterday.
b) Ravi had gone Calicut yesterday.
c) Ravi went to Calicut yesterday.
d) Ravi go to Calicut yesterday.
27. Where does the poet see the golden daffodils?
a) on the trees; b) the lake under the tree
c) near the lake under the tree; d) on the hill.
28. He was taken the hospital (Turn in to Passive voice)
a) Some body take him to hospital.
b) Some body had taken him to hospital.
c) Some body had been taken him to hospital
d) Some body took him to hospital.

29. The boy want to _____ his new dress.
a) put on; b) put up; c) put off; d) put in.
30. The meeting of Bhisma with Duryodana was _____.
a) encouraging; b) inspiring; c) affectionate;
d) optimistic.

हिन्दी

Std. X
Time : 15 minutes.

1. प्रयाग बौत नामक कावता किसकी है ?
 { मैथिलीशरण गुप्त, रामधारी सिंह दिनकर, श्री अयोध्यासिंह उपाध्याय
 हारऔय }
2. नवौन भारत के सैनकों के हाथ में ---- था ।
 { फूल, बन्दूक, उड्ग }
3. इालाहल और संजोवन उनके दोनों ----- में मलते हैं ।
 { नयनों में, हाथों में, पैरों में }
4. ननों को दुादुवों में नौतल कहां मारता है ?
 { कन्याकुनारो, मैतूर, कोवलम }
5. मैतूर के पात कौन सा पर्यटक केन्द्र है ?
 { कोवलम, गोवा, वृन्दावन }
6. कितने मित्र कहीं में उटो में रहता है ?
 { गौतम को, मोहन को, रहोम को }
7. राहत कहां काम करता है ?
 { राहम रेलवे स्टेशन में, डाक-तार विभाग में, साचवालप में }
8. शिक्षा विभाग के सब से बड़े अधिकारो कौन है ?
 { साचव, शिक्षा मन्त्रि, डि. ड. ओ }
9. "टाडापिस्ट" को हिन्दी में क्या कहते है ?
 { टंकक, क्लार्क, लिपिक }
10. मीरा बाई के आराध्य देव ---- थे ?
 { श्रीराम, शिवजी, श्रीकृष्ण }
11. क्लार्क को --- कहते है ।
 { लिपिक, निदेशक, साचव }

12. सरकार के मुख्य कार्यालय को क्या कहते हैं ?
१ दफ्तर, सचिवालय, कार्यालय
13. सरकार के विभिन्न विभागों में अक्सरों की नियुक्ति कौन करता है ?
१ शिवा विभाग, वित्त विभाग, लोग सेवा आयोग
14. --- में कौन अछी और सस्तो मिलती है ?
१ केरल में, आन्धा, उटी
15. मोरा बाई के पता कौन थे ?
१ रत्नासंह, राव दूदाजी, भोज राज
16. किस ने मोरा को भक्ति तथा ज्ञान की शिवा पुदान की ?
१ सपुराण वालों ने, जोव गोस्वामी ने, भगवान कृष्ण ने
17. "रमझोजी" किसका समानार्थक शब्द है ?
१ श्रीकृष्ण, राधा पुताप, भोजराज ।
18. प्राचीन भारत का एक प्रासन्न बौद्ध विश्व-विद्यालय विद्यालय कौन सा है ?
१ तक्षाशला, काशमीर, नलंदा
19. मठों में कौन रहते थे ?
१ भिक्षु, अध्यापक, विदेशी
20. विश्वविद्यालय के प्रमुख ---- थे ।
१ शीलभद्र, अशोक, गुप्त
21. सातवीं सदी में भारत में आकर नालंदा के संबन्ध में लिखे यात्री --- थे ।
१ हीनसाइ, कुमिन्दाइ, सेल्युक्स
22. हम शामको मैदान में खेलते हैं । तात्कालिक वर्तमान काल स्पष्ट लिखो ।
१ हम शाम को मैदान में खेलते थे ।
हम शाम को मैदान में खेल रहे हैं ।
हम शाम को मैदान में खेलते होंगे ।
23. स्त्री लिंग शब्द चुनकर लिखो-
१ जानकारी, पानी, षंड्यन्त्र

24. सही वाक्य कौन-सा है ?
 § हम हिन्दी पढ़ना चाहिए ,
 हम से हिन्दी पढ़ना चाहिए ,
 हमको हिन्दी पढ़नी चाहिए । §
25. सही रूप कौन-सा है? वे + ने -
 ° § उन ने, वे ने, उन्होंने §
26. सामान्य भ्राजक्यात काल रूप लखो -
 § लड़कियाँ गाना गाती होगी ।
 लड़कियाँ गाना गारंगी ।
 लड़कियाँ गाना गाती है । §
27. सामान्य भ्रूतकाल रूप लखो --
 § अध्यापक ने पढ़ाया ।
 अध्यापक ने पढ़ाया था ।
 अध्यापक पढ़ाता था । §
28. सही वाक्य कौन-सा है ?
 § मुझ को गा सकता है ,
 मेरे गाना सकता हूँ ।
 मैं गा सकता हूँ । §
29. कोई + ने बहुवचन रूप कौन-सा है ? §
 § किन्होंने ,
 किसी ने
 कोई ने §
30. नित्यता बोधक वाक्य को चुनो -
 § हम कारखाने में काम करेंगे ।
 हम कारखाने में काम किया करेंगे ।
 हम कारखाने में काम करते हैं । §

1. Which place did the British get according to Srirangapatnam treaty
a. Mahi b. Malabar c. Goa d. yanam
2. Where did the great revolt of 1857 start?
a. Delhi b. Punjab c. Meerut d. Calcutta
3. Who presided over the first meeting of congress at Bombay in 1885?
a. Nehru b. Gandhiji c. W.C.Banerjee
d. Tilar
4. _____ was the chairman of the draft committee formed for the preparation of the new constitution.
a. Dr.Ambedkar b. Rajendra Prasad c. K.M.Munshi
d. Rajagopalachary
5. The instrument used to measure atmospheric pressure:-
a. Barometer b. Thermometer c. Hydrometer
d. None of these
6. The short hand of a Geographer.
a. Globe b. Grider c. Map d. Atlas
7. The tropical cyclone in the South China sea is known as
a. Tynoon b. Haricanes c. Tornado d. willy-willer
8. The decay of rocks due to chemical change is called
a. disintegration b. decomposition
c. movement d. Rock salt
9. Who is "The most courageous leader of the rebels" according to Military head Sir Hueror
a. Tantia Tope b. Nana Sahib c. Home movement
d. Ramakrishna Mission.

10. Which is different in the following:-
- a. Brahma Samaj
 - b. Arya Samaj
 - c. Home movement
 - d. Ramakrishnan Mission
11. The most difficult war fought by the British in the Indian Sub continent.
- a. Burma War
 - b. Battle of Plassey
 - c. First Sikh War
 - d. Second Sikh War.
12. Which of the following is related to Dutch?
- a. Hortus Malabaricus
 - b. Udhyamparoor Sunahachoy
 - c. Cashew
 - d. None of these
13. The product formed by the decay of dead plants and animals.
- a. Peat
 - b. Petrol
 - c. rock oil
 - d. granite
14. An example for the river in India flowing through Vindya valley.
- a. Godaveri
 - b. Sindu
 - c. Krishna
 - d. Tapti
15. Which of the following does not relate to William Bendick?
- a. Introduction of permanent land revenue system
 - b. English became the teaching medium in India
 - c. Abolition of Sati.
 - d. Implement the law for the abolition of infant killing
16. The gas responsible for the increase in the heat in the lower part than upper part in the stratosphere.
- a. Oxygen
 - b. Ozone
 - c. Nitrogen
 - d. Helium

17. The main reason for the withdrawal of the portuguese from Calicut?
- less benefit received from Zamorin.
 - powerful resistances of the Arabs
 - the right for the establishment of the commercial centre in Cochin.
 - the Portuguese head Kabral didn't get the past of viceroy.
18. Which is not the reason for the decline of the portuguese power in India?
- The power was limited only to the coast.
 - spread of Christianity and religious prosecution.
 - Introduction of tobacco in India.
 - Decline of the Portuguese power in the sea.
19. The reason for the opposition to Lord Rippon from the Europeans in India?
- Removal of the discrimination in the Judiciary.
 - Reducing the working hour of women& children.
 - Recommendation for the educational development.
 - withdrawal of the law on language paper.
20. Why did Ravindranath Tagore denied the honour of Sir by the British
- Churi Chura incident.
 - Jalian Vala Bag massacre.
 - Moderator turned against the British
 - Punjab came under Marshal law.
21. Which one gives the visual evidence for the existance of water in the atmosphere.
- Rain
 - Clew
 - Wind
 - Cloud.
22. rocks do not have the crystalline structure.
- seclimentary rocks
 - Metamorphic rocks.
 - Extrusive rocks
 - Intrusius rocks.

23. An example for the rift valley.
- | | |
|-------------------------|-----------------------|
| a. Nile river valley | b. Kashmir valley. |
| c. Narmada Tapti valley | d. Sindu river valley |
24. The land formed in between two parallel fault.
- | | |
|----------------|------------------|
| a. Rift valley | b. fold mountain |
| c. harst | d. continent |
25. Gandhiji stopped the non-co-operation movement because of
- | | |
|-------------------------|------------------------|
| a. Khilaphat movement | b. Malabar revolt |
| c. Churi Chura incident | d. Vikkam Sathyagraha. |
26. Green land appears four times that of Arabia in Projection.
- | | | | |
|---------------|-----------|------------|-------------|
| a. Mollweides | b. Bonnes | c. Conical | d. Marcater |
|---------------|-----------|------------|-------------|
27. The reason for the attraction of the Europeans to India?
- | |
|--|
| a. The rich and prosperous wealth of India |
| b. The Turkey conquered constantinople. |
| c. Interest of Europeans in voyage and exploitation. |
| d. To establish an empire in India. |
28. The reason for the bending of plants
- | | | | |
|--------------|--------------|---------------|-------------|
| a. Movements | b. Diverging | c. Converging | d. faulting |
|--------------|--------------|---------------|-------------|
29. Which is the high pressure belt near equator in the following:-
- | | |
|-------------------|------------------|
| a. Horse latitude | b. Polar belt |
| c. Sub polar belt | d. None of these |
30. The directional changes to the wind due to seasonal changer is season's main significance.
- | | |
|------------------|--------------------|
| a. Polar climate | b. Monsoon climate |
| c. Mediteranean | d. Hot climate |

PHYSICS

Standard X
Time 15 Minutes

1. The scientist who proposed the quantum theory
a. Einstein b. Max Planck c. Huygens d. Maxwell
2. The readiation that causes sunburn is
a. cosmic rays b. UV rays c. infrared d. visible light
3. The beautiful colours seen on soap bubbles is due to the phenomenon of light known as
a. refraction b. diffraction
c. interference d. dispersion
4. The material as heating elements in bulbs is
a. Tungesten b. Iron c. Molybdenum d. Nichrome
5. The scientist who discovered that light is a form of transverse wave was
a. Augustin b. Christian Huygens c. Thomas Young
d. Fresnel
6. The velocity of electromagnetic waves in vaccum is _____ m/s
a. 3×10^5 b. 3×10^8 c. 3×10^{10} d. 3×10^{11}
7. An example secondary colour is
a. yellow b. blue c. red d. green
8. In foggy nights motor cars use head lights giving out _____ light
a. yellow b. red c. blue d. white
9. The rays used for taking photographs of distant object are
a. blue b. violet c. infra red d. yellow

10. A property which a heating element should not possess is
 a. high resistance b. high ductility
 c. low melting point d. low density
11. The instrument used to increase the voltage of d.c is
 a. transformer b. dynamo
 c. motor d. induction coil
12. The unit of resistance is
 a. Ohm b. volt c. meter d. Newton
13. The voltage of neutral wire is
 a. 400 V b. 230 V c. 0V d. 110 V
14. The commercial unit of electrical energy is
 a. Joule b. kWh c. Volt d. Ohm
15. The formula for determining the power of an electrical appliance is
 a. $p = E^2 I$ b. $p = I^2 E$ c. $p = \frac{EI}{t}$ d. $p = EI$
16. The chemical effect of electric current is made use of in
 a. Galvanoscope b. Electric Motor
 c. Electroplating d. Electric Cooker
17. The electromagnetic wave which has highest wave length is
 a. radar wave b. infrared c. cosmic rays d. radio waves.
18. The material used for making temporary magnet is
 a. Steel b. alnico c. nichrome d. soft iron.

19. In household circuit fuse wire is capable of carrying
a. 6A b. 5 A c. 3 A d. 2A
20. When the resistance of the conductor increases, the current through the conductor
a. increases b. decreases c. remains the same
21. An example of a metal which emit electrons when light is incident on it is
a. Fe b. Cu c. Al d. K
22. In our country electricity is supplied to houses at _____ volts
a. 230 V b. 5 A c. 110V d. 66 KV
23. Iron obtained in the anode is
a. Copper b. Sulphur c. Oxygen d. Hydrogen
24. A 500 W lamp is used for 4 hours. The energy consumed is _____
a. 4 units b. 2 units c. 6 units d. 1 unit
25. An electrolyte which ionises in two stages is
a. Calcium hydroxide b. Hydrochloric Acid
c. Nitric Acid d. Sulphuric Acid.
26. The frequency of the household mains electric supply is
a. 50 HZ b. 100 HZ c. 220 HZ d. 60 HZ
27. The phenomenon by which current is produced by the relative motion of the conductor or magnet so as to cut the lines of flux is called
a. Magnetic induction b. induced current
c. electro magnetic d. self induction

28. The energy of photon is proportional to its _____

- a. Wave length
- b. frequency
- c. speed
- d. mass

29. The number of flux lines/unit area is called

- a. Magnetic liner of flux
- b. flux density
- c. magnetic flux
- d. permeability

30. Which of the following is not true

- a. medium is necessary for the propagation of c.m waves
- b. a medium is not necessary for the propagation of c.m waves
- c. infrared rays causes sunburn
- d. frequency decreases with increases in wave length

- 1 The fuel used in atomic reactors is _____
((a) Coke (b) Coal (c) Magnesium (d) Uranium)
- 2 The maximum number of electrons that can be accommodated in an orbital is _____
((a) 2 (b) 6 (c) 8 (d) 12)
- 3 Transition elements belong to _____ block of the periodic table
((a) s (b) p (c) d (d) f)
- 4 Cations having _____ charge (
((a) positive (b) negative (c) neutral (d) none of the above.)
- 5 The metal which exists in liquid state at 0°C is _____
((a) Na (b) K (c) Hg (d) Br)
- 6 The number of electrons present in the valence shell of chlorine atom is (
((a) 1 (b) 5 (c) 7 (d) 8)
- 7 The factor which does not affect the rate of chemical reaction is
((a) Colour (b) Temperature (c) pressure (d) Catalyst)
- 8 Caloric value of fuels is expressed in
((a) Cal/Kg (b) J/gm (c) Cal/gm (d) Kg/J)
- 9 The catalyst used to accelerate the rate of decomposition of hydrogen peroxide is
((a) Manganous sulphate (b) Manganese dioxide
(c) Magnesium oxide (d) Vanadium pentoxide)

- 10 Electric current produced in a torch cell is due to
((a) Thermal reaction (b) Chemical reaction
(c) Nuclear reaction (d) Electrochemical reaction)
- 11 S block elements belong to _____ groups
((a) I and II (b) II and III (c) III and IV
(d) III to VII group)
- 12 An element which is used as fuel is
((a) N_2 (b) O_2 (c) H_2 (d) He)
- 13 The metal which displaces hydrogen from water is
((a) Cu (b) Mg (c) Ag (d) Fe)
- 14 The products of dissociation of Ammonium Chloride is
((a) Ammonium and chlorine, (b) Ammonia and Chloride
(c) Ammonia and Hydrogen chloride (d) Nitrogen,
Hydrogen and Chlorine)
- 15 Activated complexes are very unstable as they possess
high
((a) Potential energy (b) Kinetic energy (c) Heat
content (d) Threshold energy)
- 16 When hydrogen peroxide decomposes we get
((a) Hydrogen and Oxygen (b) Water and Oxygen
(c) Water and Hydrogen (d) Water and Nitrogen)
- 17 An example for a reversible reaction is
((a) Burning of Magnesium in air (b) Burning of
Carbon in air (c) Reaction between Sulphur dioxide
and oxygen to give sulphur trioxide (d) Reaction
between hydrochloric acid and sodium hydroxide)
- 18 Potassium compounds give _____ colour to a non-luminous
flame
((a) Yellow (b) Lilac (c) Red (d) Green)

- 19 In the manufacture of ammonia from hydrogen and nitrogen, the pressure used is
((a) Low (b) Very low (c) High (d) Very high)
- 20 The most suitable temperature for the production of sulphur trioxide from sulphur dioxide and Oxygen is
((a) 500°C (b) 450°C (c) 0°C (d) 1000°C)
- 21 The earthy impurities present in an ore are called
((a) Mineral (b) Gangue (c) Flux (d) Slag)
- 22 In cyanide process _____ is used for separating the metal from the cyanide solution
((a) Carbon (b) Zinc (c) Iron (d) Silver)
- 23 The chemical formula for iron 3+ thiocyanate is
((a) FeCNS (b) Fe₂(CN)₃ (c) Fe₃(CNO)₂ (d) Fe(CNS)₃)
- 24 The formula for soda ash is
((a) CaCO₃ (b) Na₂CO₃ (c) NaHCO₃ (d) 10 H₂O)
- 25 When sodium chloride solution is electrolysed _____ is obtained at the anode
((a) Chlorine (b) Oxygen (c) Ion (d) Hydrogen)
- 26 An example for a metalloid is
((a) Uranium (b) Germanium (c) Mercury (d) Phosphorous
- 27 An example for a reaction in which light energy is liberated is
((a) Photosynthesis (b) Photography (c) Phosphorescence (d) Photoelectric effect)
- 28 The number of orbitals in the 'L' shell is
((a) 2 (b) 4 (c) 9 (d) 16)

29 The substance obtained on passing hydrogen over heated sodium is

- ((a) Sodium hydroxide (b) Sodium Oxide
(c) Sodium hydride (d) Sodium peroxide)

30: The Ion which has the highest tendency to lose electrons is

- ((a) DH^- (b) Cl^- (c) NO_3^- (d) SO_4^{2-})

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B I O L O G Y

Standard - X

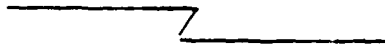
Time: 15 mts.

1. The excretory organ in insects is _____.
a) Contractile vacuole; b) malpighian tubule;
c) Chitin; d) renal tubule.
2. The transparent front part of the sclewa is called _____.
a) ivis; b) retina; c) cornea; d) pupil.
3. The chromosome number of man is _____.
a) 23; b) 46; c) 48; d) 43.
4. The deficiency of thyroxine in children causes _____.
a) cretivism; b) mixoedema; c) dwarfism;
d) gigantism.
5. Which of the following is a chemical used as an anti-coagulant?
a) sodium chloride; b) barium; c) sodium citrate;
d) antibiotic.
6. The blood group of universal donor.
a) A; b) B; c) AB; d) O.
7. The hormone that converts glucose into glycogen.
a) thyroxine; b) insulin; c) glucagon; d) cortisone.
8. The organism that reproduces by budding.
a) Hydra; b) Planaria; c) Rhizopus; d) Amoeba.
9. The young one of grasshopper is called _____.
a) larva; b) nymph; c) pupa; d) cocoon.
10. The normal level of glucose in the human blood is _____.
a) 100-120 mg/100 ml.; b) 80-100 mg/120 ml.;
c) 80-120 mg/100 ml.; d) 80-120g/100 ml.

11. All our voluntary actions are controlled by _____.
a) cerebrum; b) cerebellum; c) hypothalamus;
d) medulla oblongata.
12. Skeletal muscles are connected to the bones by _____.
a) fibres; b) ligaments; c) muscle fibres;
d) ciliary muscles.
13. The isotope of _____ is used to detect defects of the alimentary canal.
a) barium; b) iodine; c) calcium; d) phosphorus.
14. Ammonia, the waste product is produced by the oxidation of _____.
a) fatty acids; b) urea; c) glucose; d) amino acids.
15. The taste buds for bitter taste are situated in the _____ of the tongue.
a) back part; b) front part; c) middle part; d) sides.
16. The excessive use of the antibiotic _____ affects the bone marrow.
a) Tetracyclin; b) Streptomycin; c) Penicillin;
d) Chloramphenicol.
17. The ear ossicle that first receives the sound waves is _____.
a) incus; b) malleus; c) stapes; d) tympanum.
18. The diseases inoculated with DPT.
a) Diphtheria, Polio & Tetanus; b) Diphtheria, Whooping cough & Tetanus;
c) Diphtheria, TB & Tetanus;
d) Diphtheria, Polio & TB.
19. The deficiency of _____ causes Diabetes insipidus.
a) Insulin; b) Thyroxine; c) Cortesone; d) ADH.

20. The hormone that controls the utilization of calcium in the human body is secreted by _____.
- a) thyroid; b) parathyroid; c) pituitary; d) adrenal.
21. Which one of the following is a process seen only in animals?
- a) metabolism; b) hormonal control; c) transpiration; d) nervous control.
22. Excess aminoacids are converted into carbohydrates becomes they
- a) are not useful to the body; b) cannot be stored in the body; c) contain nitrogen; d) cannot release energy.
23. The function of Eustachian tube
- a) increases the air pressure in the middle ear;
b) protects the tympanum from damage;
c) increases the air pressure in the inner ear;
d) regulates the pressure outside the tympanum.
24. The acid base balance in the human body is maintained due to the accumulation of _____ in the blood.
- a) O_2 ; b) CO_2 ; c) Ammonia; d) urea.
25. The insects are well adapted to live in drought conditions because they excrete _____.
- a) urea; b) ammonia; c) uric acid; d) water.
26. The roots of trees growing near the pond, move towards the pond because they exhibit _____.
- a) +ve hydrotropism; b) -ve hydrotropism;
c) +ve geotropism; d) -ve geotropism.
27. A person suffering from cold experiences subminimal taste because
- a) smell cannot be experienced;
b) taste buds are damaged;
c) bitter taste is felt in the mouth;
d) chemoreceptors are damaged.

28. The necessity of producing urea in the human body is to
- a) remove CO_2 on a large scale;
 - b) maintain the acid-base balance;
 - c) reduce the toxicity of ammonia;
 - d) increase the production of glycogen.
29. Drunkards are unable to walk properly because the functioning of _____ is affected.
- a) cerebrum; b) cerebellum; c) medulla oblongata;
 - d) hypothalamus.
30. The speciality of the human eye that helps to see objects clearly irrespective of distance.
- a) the ability of the pupil to contract and relax;
 - b) the transparency of the cornea;
 - c) the auto regulation of the curvature of the eye lense;
 - d) the movement of the lense forward & backward.



M A T H E M A T I C S

Standard - X

Time: 15 mts.

1. What is the number of edges of a pyramid which has 7 faces?
a) 8; b) 10; c) 12; d) 14.
2. If one factor of $27P^3 - 1/8$ is $3P-1/2$ then the other factor is _____.
a) $9P^2-3/2P+1/4$; b) $9P^2+3/2P+1/4$;
c) $9P^2-3/2P-1/4$; d) $9P^2-1/4$.
3. If the expansion of $(a+b)^{n+1}$ contains 6 terms, what is the value of n?
a) 7; b) 6; c) 5; d) 4.
4. If the n^{th} term of a G.P. is $2/7 (1/3)^{n-1}$ what is its first term?
a) $2/21$; b) $2/7$; c) $2/7 \times 0$; d) $2/7 \times 1/3 \times 0$.
5. What is the number of faces of a pipe?
a) 1; b) -2; c) 3; d) 4.
6. What is the coefficient of N^2 in the expansion $(1-3x)^3$?
a) -9; b) -27; c) 27; d) 9.
7. Which of the following represents the area of $\triangle ABC$?
a) $\frac{1}{2}ab \sin A$; b) $\frac{1}{2}bc \sin C$; c) $\frac{1}{2}ab \sin B$;
d) $\frac{1}{2} ab \sin c$
8. \widehat{PAQ} and \widehat{PBQ} are opposite areas of a circle if $\widehat{PAQ}=3x+10$ and $\widehat{PBQ}=5x+30$, what is the value of x?
a) 20; b) 40; c) 30; d) 50.
9. If the second term and the third term of an A. P. are -7 and -11 respectively, then the first term is _____.
a) -3; b) -4; c) 3; d) 4.

10. If $(x-2)^3 = x^3 + Kx^2 + 12x - 8$, what is the value of K?
 a) 12; b) 6; c) -6; d) -12.
11. Which of the following is the common ratio of the progression $1/27, 1/9, 1/3, \dots$?
 a) 3; b) -3; c) $1/3$; d) $-1/3$.
12. The sum of the 10 terms of the progression $-1, +1, -1, \dots$?
 a) -1; b) 0; c) +1; d) 10
13. Which of the following is the n^{th} term of the progression $12, 17, 22, \dots$?
 a) $3n+9$; b) $5n+7$; c) $7n+5$; d) $8n+4$.
14. If 'a' is the degree measure of a minor arc of a circle, which of the following is always true about a?
 a) $0 < a < 90$; b) $90 < a < 180$; c) $0 < a < 360$; d) $0 < a < 180$.
15. The measure of a diagonal of the base of a square pyramid is 'm' cm which of the following is the volume of the pyramid if its height is 'n' cm?
 a) $1/6m^2n$; b) $2/3m^2n$; c) $1/2m^2n$; d) $1/3m^2n$.
16. What is the sum of the first 10 terms of the progression $1/3, 1, 3, \dots$?
 a) $\frac{1-3^{10}}{6}$; b) $\frac{3^{10}-1}{3}$; c) $\frac{3^{10}-1}{6}$; d) $\frac{3^9-1}{6}$
17. The lateral faces of a square pyramid are regions of equilateral triangles. If the length of one of its lateral edges is 'n' cm, what is the area of lateral faces?
 a) $1/2 3x^2$; b) $3x^2$; c) $2 3x^2$; d) $3/2 3x^2$.
18. Which of the following is equal to $\frac{\cos 75}{\cos 15}$?
 a) $\tan 15$; b) $\cot 15$; c) $\tan 75$; d) $\cos 5$.
19. If a, b, c and d represent the measures of a base edge, slant height, height and a lateral edge of a square pyramid respectively, which of the following will near be true?
 a) $a < b$; b) $b < d$; c) $d < c$; d) $q < c$.

20. If $\sin^4 Q - \cos^4 Q = 4$ which is the value of $\sin^2 Q - \cos^2 Q$?
 a) 4; b) 3; c) 2; d) 1.
21. Which of the following is equal to $\frac{\cos A}{1 - \sin^2 A}$?
 a) $\sin A$; b) $\tan A$; c) $\operatorname{cosec} A$; d) $\cot A$.
22. If the second term of a G.P. is 100 and its common ratio is $1/10$, what is its sixth term?
 a) $100(1/10)^6$; b) $100(1/10)^5$; c) $1000(1/10)^5$; d) $10(1/10)^5$
23. If the sum of n consecutive terms of an AP is $3n^2 - 5n$, what is its second term?
 a) -2; b) 2; c) 7; d) 4.
24. If $1/p, 1/q, 1/r$ are 3 consecutive terms of an A.P., what is the value of Q ?
 a) $\frac{2Pr}{p+r}$; b) $\frac{p+r}{2pr}$; c) $\frac{p+r}{pr}$; d) $\frac{pr}{2(p+q)}$
25. If the outer and inner circumferences of the cross section of a pipe are 18π and 10π respectively, what is the width of the pipe?
 a) 1; b) 3; c) 4; d) 8.
26. In $\triangle ABC$, $\angle B = 90^\circ$, $AB = BC = S_2$. What is the radius of circumcircle of $\triangle ABC$?
 a) 1 cm.; b) 2 cm.; c) 2 cm.; d) 22 cm.
27. AB is a chord of a circle with centre C. If $AB = AC$ what is the degree measure of minor arc AB?
 a) 30; b) 45; c) 60; d) 90.
28. Which of the following sequences is neither an A.P. nor a G.P?
 a) $1/27, 1/9, 1/3, \dots$
 b) $1/2, 1/3, 1/4, \dots$
 c) $-52, -48, -44, \dots$
 d) $2+3, 5+3, 8+3, \dots$

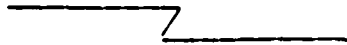
29. The volume of a pipe is 10π cm³ and its total area of the curved faces is 15π cm², what is the thickness of the pipe?

- a) $1\frac{2}{3}$; b) $2\frac{2}{3}$; c) 3; d) $1\frac{1}{3}$. .

30. The third term of a G.P. is $\frac{7}{24}$ and the sixth term is $\frac{7}{192}$

What is its nth term? .

- a) $\frac{7}{3 \times 2^n}$; b) $\frac{7}{6 \times 2^n}$; c) $\frac{6 \times 2^n}{7}$; d) $\frac{7 \times 2^n}{3}$



APPENDIX 25

UNIVERSITY OF CALICUT
DEPARTMENT OF EDUCATION

Score Sheet for Achievement Test

NameM/F Standard.....
Name of school..... Subject.....

	a	b	c	d		a	b	c	d		a	b	c	d
1	0	0	0	0	11	0	0	0	0	21	0	0	0	0
2	0	0	0	0	12	0	0	0	0	22	0	0	0	0
3	0	0	0	0	13	0	0	0	0	23	0	0	0	0
4	0	0	0	0	14	0	0	0	0	24	0	0	0	0
5	0	0	0	0	15	0	0	0	0	25	0	0	0	0
6	0	0	0	0	16	0	0	0	0	26	0	0	0	0
7	0	0	0	0	17	0	0	0	0	27	0	0	0	0
8	0	0	0	0	18	0	0	0	0	28	0	0	0	0
9	0	0	0	0	19	0	0	0	0	29	0	0	0	0
10	0	0	0	0	20	0	0	0	0	30	0	0	0	0

Marks Obtained In The Last Class Examination
(Percentage)

a) Malayalam

b) English

c) Hindi

d) Social Studies

e) Physics

f) Chemistry

g) Biology

h) Mathematics

THE KERALA UNIVERSITY VERBAL GROUP TEST OF INTELLIGENCE FOR
 SECONDARY SCHOOL
 SCORE SHEET

Name..... Class..... No.....School.....

TEST I					TEST II					TEST III				TEST IV			TEST V				
A	B	C	D		A	B	C	D	E	A	B	C	D	A	B	C	A	B	C	D	
1	0	0	0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0
2	0	0	0	0	2	0	0	0	0	2	0	0	0	2	0	0	2	0	0	0	0
3	0	0	0	0	3	0	0	0	0	3	0	0	0	3	0	0	3	0	0	0	0
4	0	0	0	0	4	0	0	0	0	4	0	0	0	4	0	0	4	0	0	0	0
5	0	0	0	0	5	0	0	0	0	5	0	0	0	5	0	0	5	0	0	0	0
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16	0	0	0	0	16	0	0	0	0	16	0	0	0	16	0	0	16	0	0	0	0
17	0	0	0	0	17	0	0	0	0	17	0	0	0	17	0	0	17	0	0	0	0
18	0	0	0	0	18	0	0	0	0	18	0	0	0	18	0	0	18	0	0	0	0
19	0	0	0	0	19	0	0	0	0	19	0	0	0	19	0	0	19	0	0	0	0
20	0	0	0	0	20	0	0	0	0	20	0	0	0	20	0	0	20	0	0	0	0

Marks Obtained In The Last Class Examination
(Percentage)

a) Malayalam

b) English

c) Hindi

d) Social Studies

e) Physics

f) Chemistry

g) Biology

h) Mathematics