PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY - A STUDY ON HIGHER SECONDARY STUDENTS

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DECLARATION

I hereby declare that this dissertation entitled **"PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY - A STUDY ON HIGHER SECONDARY STUDENTS "** has not been submitted by me for the award of any degree, diploma or title to any other University.

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CERTIFICATE

This is to certify that the dissertation entitled **"PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY A STUDY ON HIGHER SECONDARY STUDENTS "** Submitted for the M.Ed degree by **P.Jabasi** is a record of research work done by her under my guidance and supervision. It is further certified that this work is original one free from any duplication.

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Education is a life long process . It is through education knowledge , character and behavior of the younger generation is to be perfectly moulded. Education takes place when ideas combine with the old . Education has a great significance for people emerging for long period of bondage in to self –rule and sovereign democracy . In a democratic country education performs the two fold functions of achieving individual fulfillment and enrichment of social life.

Education begins at birth and continues throughout life till death. The child learns through his experience. He gains experience when he comes in contact with different social institutions, persons, places and things. There is no end to this experience. It goes on for ever without any break or barriers. Thus, education becomes an active and dynamic process. It is

much more than schooling, memorizing or learning a prescribed syllabus. Therefore, J.S Mackenzie rightly says "Education is a process that goes on throughout life, and is promoted by almost every experience that is relevant to it and gains new experience". Thus, the child goes on reconstructing experience throughout his life . Therefore education is considered by the educationists as an active and dynamic process.

IMPORTANCE OF CHEMISTRY IN EVERYDAY LIFE

Chemistry has made a significant contribution in the fields of drugs, fuel, fibers, industry, medicine etc. In addition to these there are many other interdisciplinary areas where the contribution of chemistry is significant.

Drugs

Many substances from natural sources have been used since time immemorial for treatment of diseases. For example, an extract from the bark of popular, olive or willow trees was recommended more than two thousand years ago by Hippocrates the father of medicine for treating fever. At present we can isolate and purify the drug from natural sources and establish their chemical structure. Sparsely occurring substances can be synthesized in the laboratory and in this way made available in abundances .Moreover even such drugs which do not occur in nature have been obtained by synthesizing them in the laboratory. Aspirin is one of the earliest synthetic drugs. Some other prominent synthetic drugs are sulpha drugs, antibiotics, anesthetics etc.

Food

Chemist had done a lot to increase food grain production and helped to bring about green revolution. Synthetic fertilizers were developed which provide the essentials elements for growth of plants. The use of these fertilizers led to higher yield of plants. Insecticides, weed killers, fungicides developed by chemists have contributed a lot to increase the availability of food grains for the mankind. In many countries farmers use laboratory made chemicals as defoliants. For example, magnesium chlorate when applied to ripened cotton crop causes the leaves to fall of thus making harvesting much cheaper and faster . Chemicals are also used in animal farming . For example , 'Marlate' -a new insecticides –used as a dip or as a spray kills blood –sucking horn flies which attract cows . This step alone leads to 10% increase in milk supply.

Fuels

Till the middle of this century only naturally occurring substances such as wood , coal , coke etc were used as fuels but now the situation has been completely changed by processing of petroleum . Petrochemical industry also provides many useful chemicals like benzene , toluene , xylene , naphthalene etc . Petrochemicals provide the base of synthetic fibers , rubber , resins , detergents , refrigerants and explosives .

Fibers

Nowadays we are producing synthetic fibers like nylon , and terylene . These fibers in some respects excel the natural fibers . They are longer lasting , crease resistant and quick draying .

In addition to these there are many inter-disciplinary areas where contribution of chemicals is significant. For example production of glasses and ceramics , electronics , fiber-based composites : etc . In the area of environmental pollution chemists are finding better methods of analysis and solution to get rid of pollution . Marine chemistry is concerned with investigating new source of food and chemicals .

Industry

Many industrial process use acids and bases . Metals are often treated with acids to clean them . The manufacture of a wide variety of products involves the use of acids and bases . Fertilizers , synthetic fibers and drugs all manufactured with acids and bases .

In industry , radioactive isotopes , or radio isotopes , have additional uses to find leaks and weak spot in metal pipes , such as oil pipe lines etc .

Medicine

Radioisotopes makes an important contribution is in the field of medicine . The branch of medicine in which radioactivity used is known as nuclear medicine . Tracers are extremely valuable in diagnosing diseases . For example , radioactive iodine – iodine-131 can be used to study the function of the thyroid gland which absorbs iodine, Sodium-24 can be used to detect diseases of the circulatory system .

PLACE OF CHEMISTRY IN THE SCHOOL CURRICULUM

Chemistry is that branch of science which deals with the study of the nature of matter , its composition , occurrence , isolation methods of preparation , properties and uses .

Kothari commission (1964-1966) stated that “We lay great emphasis on making science an important elements in the school curriculum . We therefore recommend that science and mathematics should be taught on a compulsory basis to all pupils as a part of general education during the first ten years of schooling . In addition there should be provision of special courses in these subjects at the secondary stage for students of more than average ability ’’

By 1900, the primary school curriculum , had hardly developed beyond the 3R’S, but the educationists of the 20 th century held the view that the curriculum should be taught of in terms of activity and experience rather than of knowledge to be acquired and facts to stored . In shaping the habits , emotions and feeling of the pupils , chemistry teaching performs a very significant role . Chemistry should from an essential part of the curriculum, as it is only subject which affords knowledge of certain facts and laws and help in main objectives of education. It is essential for the successful solution of the problem of life. It provides discipline of mind. So , we lay great emphasis on making on chemistry an important subject in the school .

In India through the effort of National council of educational research and training, chemistry has been made a compulsory subject throughout the school stage. It is an important subject in the school curriculum as many professional and applied courses directly or indirectly use the knowledge of chemistry . Moreover , the present age is the era of science and more number of people are being employed in scientific pursuits which require knowledge of chemistry .

Chemistry is essentially a secondary school subject. At this level it may be taught as a subject in its own rights or as part of a broader science course identified by a variety of titles

such as integrated science general science and modular science . The discipline may also feature as a component of courses in physical or biological science.

PROBLEM SOLVING ABILITY

Problem Solving as the name indicates begins with the statement of a problem that challenges the students to find a solution. The problem centres around the subject matter under study and requires the use of information and skills available to the students. In the process of solving the problem the students may be required to gather data, analyse and interpret the information to arrive at a solution to the problems.

From birth onwards everybody in this world is beset with some problem or the other .There are needs and motives that are to be satisfied. For this purpose definite goals or aims are set. In an attempt for their realization one's attempt to achieve them .This creates problems and serious and deliberate efforts have to be made to overcome these impediments.

The productive work involved in the evaluation of the situation and the strategy worked out to reach one's set goals is collectively termed problem solving. This is an essential exercise for individual advancement as also for the advancement of society.

Definitions of problem-solving

" Problem solving is a planned attack upon a difficulty or perplexity for the purpose of finding a satisfactory solution" - Risk .T.M

According to skinner (1968) “Problem solving is a process of overcoming difficulties that appear to interfere with the attainment of a goal. It is a procedure of making adjustment inspite of interferences”.

According to Lak June May (1970) “Problem solving is a complex mental process involving visualization ,imagination, manipulation, abstraction and association of ideas”.

Problem solving is an educational device where by the teacher and pupils attempt in a conscious planned purposeful effort to arrive at an explanation or solution to some educationally significant difficulty (Lee M James).

. Problem solving involves finding an appropriate way to attain a goal . Problem solving is ability to overcome difficulties that appear to interfere with the attainment of a goal (Alice F Hearly 2005).

Nature of Problem Solving Behaviour

Problem Solving Behaviour has the following features

- Problem Solving behaviour arises only when the goal is purposeful and essential for the individual.
- It arises when there is serious obstruction in achieving the goal.
- The individual engages himself in serious mental exploration by systematically following certain planned steps to remove the obstacles.
- Problem Solving behaviour helps the individual to ultimately remove the obstacles and researches his goal.

- Problem solving behaviour helps an individual to attain a state of satisfaction when his endeavour is crowned with success.

Main objectives of problem solving

The main objective of problem solving is to stimulate the reflective and creative thinking of the students. It involves the thought process that results from a doubt a perplexity or a problem. The approach leads to the formulation of generalisation that are useful in future situations involving the solution of similar problems. The solution of a problem, whatever be its nature, practical or informational involves the process of reflective thinking.

Processes of problem Solving

Psychologists have mentioned two types of processes of Problem Solving

(a) Trial and Error

(b) Insight

a). Trial and Error

In the trial and error behaviour an organism is set for a certain goal. It explores the situation, finds certain leads and tries them one after another, fails several times, and finally kinds a good lead and reaches the goal. This process may involve motor exploration or mental exploration.

b). Insight

The gestalt psychologists emphasise the importance of perception of total situation. The classical experiments of Kohler on Chimpanzees show that solution of problem is achieved all of a sudden through insight into the solution.

Steps in Problem Solving Ability

Psychologists have suggested different steps involved in the process of problem solving behaviour of animals and human beings . Briefly they are as follows.

1. Understanding of the problem

Firstly , the problem should be clearly comprehended, otherwise it cannot be solved .It should be completely understood in all its bearings. All the obstacles in the path of the goal should be identified in the beginning.

2. Collection of the relevant information

Then the individual collects all relevant information about the problem from different sources.

3. Formation of hypothesis

In this step, the individual attempts to think out the various solutions to the problem. These hypothetical solutions are then closely analysed and evaluated. The individual

finds out whether the solutions tallies with accepted facts and investigates for any negative aspect which may vitiate the conclusion.

4. Verification of the hypothesis

The deduced results are then again verified by applying it in the solution of various similar problems. The final testing may necessitate certain changes in the original conclusion. Thus verified the final solution becomes a useful product of the individual's problem solving behaviour.

Role of teacher in Problem Solving

Helping the students in problem solving is very important in the field of education. The teacher should try to develop a scientific attitude in students to solve problems related to academic as well as social life. Although no universal doctrine can be formulated for solving all types of problem, a few useful suggestions for teachers may be offered here

1.Motivation

The teacher should motivate the students to find out the solution independently. When the students do not themselves make effort, the chance for solving problems is remote. By using various techniques, the teacher can motivate the students to a great extent.

2. Analysis of data through questioning

The teacher, through a set of questions should encourage the students to analyse the data to discover the clue to the solution.

3. Presentation of problems as a whole

The teacher should present problems in the class as a whole and not by parts. This will help the students to have perception of the total situation.

4. Divergent thinking

The teacher should encourage divergent thinking in his pupils, so that they learn to tackle the problems in various ways.

5. Use of teaching aids

Abstract problems should be concretised by using charts and other teaching materials.

6. Enough practice

The students should be given enough drilling on variety of problems so that they develop proper mental set to solve similar kinds of problem, which they may meet in future.

7. Maturity level

The teacher should present the problem keeping in view the maturity level of the students. The problem should neither be too easy, nor too difficult for the class.

Factors affecting problem solving

Every one of us in life faces one or other problem. We make out attempts with all the resources in hand in finding out solutions to these problems. Let us discuss now the

various things and factors affecting one's problem solving behaviour under the heads of this two fold classification.

1. Factors inherent in nature of the problem

The problem-solving factors depend to a great extent on the nature of the problem. Some of them may be outlined as below

a). The simplicity or complexity of the problem

b). The size or shape of the problem

c).Appropriate or inappropriate definition of the problem

d). The nature of the definiteness of the problem.

2. Factors associated with the problem solving

The problem solving behaviour also depends much on the factors associated with the nature, capacities and many other things inherent in the problem solving. These factors may be outlined as follows.

a)The level of previous learning or training

One can solve a problem easily if it has some connection with one's past experiences or specific training received for the solution of similar problems.

b) Interest and motivational level of the problem solver

Interest and motivation are known as the key factors and moving forces behind any activity or behaviour carried out by an individual. It equally applies to one's problem solving behaviour.

c) Understanding and analysis of the problem

Every problem needs a proper understanding and careful analysis before attempting to find a solution.

d) Functional fixedness

Functional fixedness refers to our rigidity or fixedness in our functions or ways of behaving. As a result we always tend to provide similar responses to the same stimuli we have a fixed pattern of problem solving behaviour to find solution for a particular type of problem.

Approaches and techniques to problem solving

1. Method of analogies

In analogy problem are solved by comparing them with similar problems that have been solved before. Thus the method of solution becomes explicit and clear.

2. Restatement method

Problem solving becomes easier if the student is able to redefine the given problem using his own language and symbols. This approach is known as restatement method.

3. Method of dependencies

In this method the problem is solved by focussing on mutually dependent components in the problem. The analysis of the problem into its constituent elements throws light on the mutually dependent elements in the problem.

4. Graphic method

The graphic representation aids the students in determining fundamental relationships that exist among the given data and to look for further details and relationships necessary for solving the given problem.

ACHIEVEMENT

Achievement means one learning attainments accomplishment and proficiencies. Achievement is directly related to pupil's growth and development in educational situations where learning and teaching intended to go on.

According to Denis Baron and Harold W. Benard, the concept of achievement involves the interaction of three factors namely aptitude for learning , readiness for learning and opportunity for learning .

According to smith et.al;(1961) "Achievement is a progress that a learner makes in learning often measured either by standard or teacher made test".

Encyclopedia of psychology defines Achievement as "the degree of success attained in a task".

Achievement is generally applied to the academic status of the child is different subjects or as a whole. It just means what pupil has learnt in different subjects. The dictionary meaning of achievement is to 'accomplish' or to 'bring successful issue'. That is something achieved by the students through classroom teaching. Achievement is usually assessed by best scores or by marks assigned by teachers.

Achievement is directly related to pupil's growth and development in educational situations. Hilgard(1957) defines Achievement as "acquired ability developed through learning or training". Since the world is becoming more and more competitive, quality of performance has become the key factor for personal progress.

School is a primary setting for academic and social experience. As Crandell et.al (1960) points out achievement is a behaviour directed towards the attainment of approval or the avoidance of disapproval for competence of performance in situations to which standards of excellence are relevant.

Achievement can be measured with the help of tests, verbal or written of different kinds. Since achievement is the criterion for selection, promotion or recognition is various walks of life, the importance of achievement cannot be ignored.

NEED AND SIGNIFICANCE OF THE STUDY

The problem solving ability is one ,which involves the use of the different ways to solve problems through reflective thinking and reasoning . Problem solving ability as the name indicates is the ability of the students to find a solution. T.M Risk defines problem solving as a planned act upon a difficulty or perplexity for the purpose of finding a satisfactory solution. Every one can benefit from having good problem solving skills as we all encounter

problems daily. Some of these problems are obviously more severe or complex than others. It will be wonderful to have ability to solve all problems efficiently.

Chemistry is considered as an important subject in school curriculum. Considering the importance science in the modern technological world the Education commission (1966) has recommended teaching of those subjects on a compulsory basis for higher secondary classes.

The teaching of chemistry should also aim at developing problem solving ability in students. In the present educational system there is little emphasis for the development of problem solving ability. Teaching is examination oriented and teachers follow only lecture method for teaching chemistry. So in order to achieve this purpose there is need for certain change in the methodology of teaching science.

Achievement in chemistry is influenced by many factors such as interest, attitude, creativity, intelligence ,anxiety, socio-economic status etc. If the student possess problem solving ability there will be high level of achievement in chemistry. Several studies have been conducted on the factors which influence achievement in chemistry. Problem solving ability is closely related to achievement .Students who have the ability to solve the complex problems can achieve more. Keeping these in view the investigator made are attempt to study the relationship between Problem solving ability and achievement in chemistry of higher secondary students.

STATEMENT OF THE PROBLEM

The problem selected for the present study is entitled as **"PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY- A STUDY ON HIGHER SECONDARY STUDENTS"**

OPERATIONAL DEFINITION OF TERMS

The key terms used in the title are defined below.

PROBLEM SOLVING ABILITY

Problem solving may be defined as a process of raising a problem in the minds of students in such a way as to stimulate purposeful reflective thinking in arriving at a rational solution .Problem solving ability is the degree of capacity to find the correct solution to problems.

ACHIEVEMENT IN CHEMISTRY

Achievement is the end gained or level of success attained by an individual or groups on the completion of a task.

In this study, the term achievement in chemistry refers to the marks scored by the students in the half yearly examination

HIGHER SECONDARY STUDENTS

Higher secondary students refers to the students who are studying in standard XI.

PROCEDURE OF THE STUDY

For the present study, the investigator adopted Normative survey method. The sample consisted of 400 higher secondary students studying in different schools of Kanyakumari District. To find out the problem solving ability of higher secondary students problem solving ability test constructed and validated by Deepa R.P and Dr. M.Sadanandan. As a

measure of achievement in chemistry marks obtained in the half yearly examination was taken . The data collected were analyzed to throw light on the factors enumerated in the objectives of the study. Mean , standard deviation , t – test ,ANOVA and pearson's product moment coefficient of correlation were used for the analysis of data.

OBJECTIVES OF THE STUDY

1. To study the level of problem solving ability of higher secondary students.

2. To study the Achievement in chemistry of higher secondary students.

3. To find out whether there is any significant difference in the mean scores of Problem solving ability of higher secondary students with respect to the background variables namely.

   (i) Gender

   (ii) Locality

   (iii) Type of management and

   (iv) Community.

4. To find out whether there is any significant difference in the mean scores of Achievement in chemistry of higher secondary students with respect to the background variables namely

   (i) Gender

(ii) Locality

(iii) Type of management and

(iv)Community.

5.To study the correlation between Problem solving ability and Achievement in chemistry of higher secondary students.

HYPOTHESES

1. There is no significant difference in the mean scores of problem solving ability of male and female higher secondary students.

2. There is no significant difference in the mean scores of problem solving ability of rural and urban higher secondary students.

3. There is no significant difference in the mean scores of Problem solving ability of higher secondary students belonging to various type of management.

4. There is no significant difference in the mean scores of Problem solving ability of higher secondary students belonging to various communities.

5. There is no significant difference in the mean scores of Achievement in chemistry of male and female higher secondary students.

6. There is no significant difference in the mean scores of Achievement in chemistry of

rural and urban higher secondary students.

7. There is no significant difference in the mean scores of Achievement in chemistry of higher secondary students belonging to various type of management.

8. There is no significant difference in the mean scores of Achievement in chemistry of higher secondary students belonging to various communities.

9. There is no significant correlation between Problem solving ability and Achievement in chemistry of higher secondary students for the total sample and subsamples.

LIMITATIONS OF THE STUDY

The scope of the study is limited in the following ways,

1 The investigator has taken only 400 higher secondary as sample for the present study. The study would be relevant if more students are included as sample.

2 The study is restricted to the schools in Kanyakumari District only . Due to lack of time the investigator was not able to visit all the schools in Tamil Nadu.

Inspite of the above limitations it is hoped that this study would serve as the basis for further research in this area.

ORGANIZATION OF THE REPORT

The present study is reported under five chapters.

CHAPTER –I : Deals with introduction, need and significance of study, statement of the problem ,definition of terms , objectives of the study ,

hypotheses, methodology in brief limitations of the study and organization of the report.

CHAPTER - II : Deals with review of Related literature.

CHAPTER -III : Deals with methodology of the present study. This chapter consists of the method adopted for the study , tools used , sample for the study and statistical techniques used.

CHAPTER – IV : Deals with analysis and interpretation of the collected data.

CHAPTER – V : Deals with findings , conclusions, educational implications and suggestions for further research .

Chapter -II

REVIEW OF RELATED LITERATURE

Research take advantage of the knowledge which has accumulated in the past as a result of human endeavor. It can never be undertaken in isolation of the work that has already been done on the problems which are directly or indirectly related to a study proposed by a researcher careful review of the research journals, books, dissertations, thesis and other sources of information on the problem to be investigated is one of the important steps in the planning of any research study.

The phrase " Review of literature" consists of two words, review and literature. The term review means to organize the knowledge of the specific area of research to evolve an edifice of knowledge to show that the proposed study would be an addition to this field . The task of review of literature is highly creative and tedious because the researcher has to synthesise the available knowledge of the world in unique way to provide the rationale of his study.

PURPOSES OF REVIEW

- The review of related literature enables the researcher to define the limits of his field. It helps the researcher to delimit and define his problem.
- By reviewing the related literature researcher can avoid unfruitful and useless problem area. Researcher can select those area in which positive findings are very likely to result and his endeavors would be likely to add to the knowledge in a meaningful way.
- Through the review of related literature the researcher can avoid unintentional duplication of well established findings.
- The review of related literature gives the researcher an understanding of research methodology which refers to the way the study is to be conducted.
- The final and important specific reason for reviewing the related literature is to know about the recommendations of previous researchers listed in their studies for further research.

The studies reviewed are classified under two heads

(a) Studies related to problem solving ability

(b) Studies related to achievement in chemistry

STUDIES RELATED TO PROBLEM SOLVING ABILITY

1. INDIAN STUDIES

Sharma (2007) conducted a study on "Problem solving ability and scientific attitude as determinant of Academic achievement of higher secondary students" .The

objectives of the study were (i) To study scientific attitude of higher secondary students in relation to sex and three levels of achievement (i) To study the relationship among academic achievement scientific attitude and problem solving ability of higher secondary students . Descriptive survey method was used for the study. The sample consisted of 240 students of XI of class of Government aided Hindi medium school, governed by U.B.Bord. The used were scientific attitude scale by P.A.Grewal and Problem solving ability test by L.N Dubey .The statistical techniques used for the analysis of the data were Man ,S.D , 't' test product moment correlation and multiple correlation. The findings f the study were (i) School science curriculum is able to develop only average level of scientific attitude and problem solving ability among higher secondary students (ii) Positive relationship exists among achievement, problem solving ability and scientific attitude.

Manohara and Ramganesh (2009) conducted a study on "Creative problem solving ability of standard XI students"**.** The objectives of the study was to find out if any significant difference in creative problem solving ability in terms of background variables namely sex, type of school and locality. Normative survey method was used for the study. The sample consisted of 200 students from higher secondary schools in Pondicherry region. The tool used was creative problem solving ability test. The statistical techniques used for the analysis of the data were Arithmetic mean and Standard deviation. The findings of the study were The male and female students , private school and government school students, rural and urban students in their creative problem solving ability. The level of creativity is average with reference to sex, type of school and locality.

Sobeya (2009) made a study on "Creativity and problem solving ability in Mathematics -A study on IX standard students". The objectives of the study were (i) To compare the mean scores of creativity and problem solving ability in Mathematics of IX standard students .For the total sample any sub samples based on Gender , locality religion , community and type of school . (ii) To study relationship between creativity and problem solving ability in Mathematics of LX standard students .survey method was used for the study .The sample consisted of 400 LX standard students. The tools used were , Nair's test of creative thinking (1984).(ii) Problem solving ability test prepared by the researcher .The statistical techniques used for the analysis of data were t-test and co- efficient of correlation. The findings of the study were (i) There is no significant difference in creativity and problem solving ability based on Gender locality type of school, Religion and community.

Prabhakaran (2010) conducted a study on "Problem solving ability in Mathematics of IX standard students". The objectives of the study were (i) To categorize the students as low average and high groups in problem solving ability in Mathematics (ii) To find out if any significant difference between the IX standard students in their problem solving ability regarding the back ground variables such as sex age locality and type of management .Normative survey method was used for the study . The sample consisted of 400 students studying in IX standard of various schools in virudhunagar district .The tools used were general data sheet and problem solving ability test. The statistical techniques used for the analysis of data were Arithmetic mean standard Deviation t-test and ANOVA. The findings of the study were , The problem solving ability in Mathematics for boys and girls are more or less same . (ii) The problem solving ability in Mathematics for rural and urban students are more or less same . The different type of management students differed in their problem solving ability

in Mathematics. The un aided school students possess better problem solving ability in Mathematics compared to Government and Aided school students.

Maniyarasan (2013) conducted a study on " Problem solving ability and Scientific aptitude of higher secondary students in Dharmapuri district". The objectives of the study were (i) To study the problem solving ability of higher secondary students of Dharmapurai district .(ii) To study the scientific aptitude of higher secondary students with respect to gender , locality , and type of management. Normative survey method was used for the study. The sample consisted of 400 students studying in various higher secondary schools in Dharmapurai district. The tool used were general data sheet, Problem solving ability test constructed and validated by .R.P.Deepa and Dr. M.Sandanandan(2011). The statistical techniques used for the analysis of data were Arithmetic mean, S.D , t- test, ANOVA, Pearson's product and moment method of correlation. The findings of the study were (i) The gender has no impact on scientific aptitude of higher secondary students. (ii) The higher secondary students possess medium level of problem solving ability and scientific attitude.

Deepa (2013) conducted a study on "Critical thinking ability and problem solving ability of higher secondary school students of kanayakumari district". The objectives of the study were (i) To study the significance of difference in the mean scores of critical thinking and problem solving ability of higher secondary school students on the basis of gender and local. (ii) To study the relationship between critical thinking ability and problem solving ability of higher secondary school students . Normative survey method was used for the study . The sample consisted of 214 students of XI standard from ten schools of kanyakumari distrist. The statistical techniques used for the analysis of data were pearson product moment coefficient

correlation and t-test .The findings of the study were. (i) The boys were found to have better critical thinking ability and problem solving ability than those of girls. The rural and urban students did not differ in their critical thinking ability .The urban students were found to have more problem solving ability then those of rural students (ii) A significant positive high correlation was found between critical thinking ability and problem solving ability of higher secondary school students.

Nabisha Banasir (2014) conducted a study on "Attitude towards mathematics and Problem solving ability of higher secondary students". The objectives of the study were The mean scores of attitude towards mathematics and problem solving ability a study on higher secondary students for the sub sample based on Gender, Locality, Type of management, Religion and Community. Normative survey method was used for study . The sample consisted of 400 students in various higher secondary schools in kanyakumari district. The tools used were attitude d towards mathematics constructed and validated by Nabisha Banasir and Prasad P.S (2014) and problem solving ability test conducted and validated by R.P.Deepa and Dr. M . Sandanandan (2011), General data sheet. The statistical techniques used for the analysis of data were t-test, ANOVA, Pearson's product moment method of correlation. The findings of study were The significant difference was noted on attitude towards Mathematics based on community,Religion, Type of management there is no significant . difference was noted on attitude towards Mathematics and problem solving ability based on Gender and locality.

Theres (2014) conducted a study on "Decision making and problem solving abilities of higher secondary students in kanyakumari District". The objectives of the study were to study the decision making ability and problem solving ability of higher secondary students in

kanyakumari district and to compare the total as well as dimension wise mean score of Decision making ability of male and female of higher secondary school students .Normative survey method was used for the study . The sample consisted of 500 higher secondary students In various schools of Kanyakumari District. The statistical techniques used for the analysis of the data were , Arithmetic mean ,S.D t-test h,ANOVA, Pearson's product moment method of correlation .The findings of the study were .The gender has no impact on decision making ability of Male and Female higher secondary school students..

Nisha Mary Jose (2014) studied "Problem solving ability and scholastic achievement of higher secondary school students". The objectives of the study were to find out whether there is any significant difference in the problem solving ability and scholastic achievement of secondary school students with respect to gender , locale and type of school . Normative survey method was used for the study . The sample consisted of 320 secondary school students of Kottayam District . The tools used were general data sheet and problem solving ability test By L.N Dubey(1971). The statistical techniques used were Pearson's correlation coefficient and t –test . The study revealed a significant relationship between problem solving ability and scholastic achievement of secondary school students.

Jose Shanty and Nikhil (2014) conducted a study on " Relationship between logical thinking and problem solving ability in chemistry of higher secondary school students". The objective of the study were (i) To study the relationship between logical thinking and problem solving ability in chemistry of higher secondary school students (ii) To compare the problem solving ability in chemistry of higher secondary school students with varying levels of logical thinking . Normative survey method was used for the study . The sample consisted of 506 higher secondary school students studying science syllabus from ten schools in kanyakumari district

.The tools used were Test of logical thinking and Test of problem solving ability in chemistry . The statistical techniques used for the analysis of data were t-test and product moment coefficient of correlation .The finding of the study were (i) There is significant difference in problem solving ability in chemistry of higher secondary school students with high, average and low logical thinking .(ii) The exists positive correlation between logical thinking and chemistry problem solving ability of higher secondary school students.

Madhumathi and Ahmed (2014) conducted a study on "Assessing problem solving Abilities based on polya's Approach". The objectives of the study were To assess the problem solving abilities of VIII class students in Mathematics with respect to gender type of school management, medium locality etc .Normative survey method was used for the study .The sample consisted of 418 high school students . The statistical techniques used for the analysis of data were mean ,S.D ,and ANOVA. The finding of the study were .There is no significant difference in problem solving abilities of VIII class students with respect to gender, locality , type of school management and type of medium etc.

Bhat (2014) conducted a study on " Effect of problem solving ability on achievement in mathematics of high school students". The objectives of the study were to study the contribution of predictor variable on criterion variable of high school students .(ii) To explore the contribution of predictor variable on criterion variable of high school male students Normative survey method was used for the study . The sample consisted of 598 high school students . The tool used was problem solving ability test by L.N Dubey. The statistical techniques used for the analysis of data were co-efficient of correlation and t-test .The findings of the study were (i) There is no significant effect of predictor variable on criterion variable of

high school students .(ii) There is no significant effect of predictor variable on criterion variable of high school female students.

2.FOREIGN STUDIES

Yimer and Asmanaw (2004) conducted a study on "Meta cognitive and cognitive functioning of college students during mathematical problem solving". The objectives of the study were,(i) To identify and characterize meta cognitive behaviour students exhibited during their engagement in non-routine problem solving. The findings of the study were, (i) A model which describes meta cognitive behaviour of college students during their engagement in mathematical problem solving engagement ,transformation ,implementation, evaluation and internationalization emerged as cognitive categories from task based interviews. (ii) The model accommodates the range of meta cognitive approaches used by students as various path-ways between the categories are possible. (ii) Students viewed problem solving as a challenge but as essential in other disciplines and in life in general.

Muis and Renee (2004) conducted a study on "Epistemic styles and mathematics problem solving examining relation in the context self-regulated learning." The objectives of the study were, to find the relation between personal epistemology and faces of self-regulated learning moves away from co relational designs and a more process oriented methodology. The findings of the study were, students profiled as predominantly rational in their approaches to knowing were predominantly rational in their approaches to problem solving.

Clayton (2005). made a study on "The influence of aesthetics on the mathematical problem solving strategies of skilled novices". The objectives of the study were to

find out the rule of aesthetic. Principles in their problem solving strategies of able high school students. The findings of the study were, a participant degree of understanding of the rule of aesthetic. Principles in their problem solving strategies increased as a result of the training received.

Biscoagit Behera (2009) conducted a study on "Problem solving skills in mathematical learning". The objectives of the study were, (i) To study the cognitive skills high mathematical ability students on mathematical problem solving. (ii)To study the cognitive skills of low mathematical ability students on mathematics problem solving. (iii) To ascertain the gender difference in mathematics problem solving skill. The findings of the study were (i) The mean difference between high ability groups, between boys and girls with in each ability groups is quite large this trend is demonstrated in each of the four component groups. (ii) There is no significant different between the mean of performance of boys and girls with in each ability group in any of component skills the possibility, the significance of difference might have been reduce due to the fact that with in each group the variance of boys and girls are guide large .(iii) The summary of ANOVA reveals significant effects of ability are highly significant.

Pimta (2009) conducted a study on "Factors influencing mathematical problem solving ability of sixth grade students". The objectives of the study were to investigate factors influencing mathematical problem solving ability of sixth grade students. The sample consisted of 1028 of sixth grade students. The Tools used were Mathematical problem solving ability test and questionnaires. Statistical techniques stratified Random sampling technique .The Findings of the study teachers behaviour took both direct and in direct effects on the students

mathematical problem solving .Direct factors influencing self esteem and teachers behaviour and indirect factors influencing motivation and self efficacy

lin (2010) studied "Analyses of Attribute patterns of creative problem solving ability among upper elementary students in Taiwan". The objectives of the study were To find the relationship among attribute of creative problem solving ability and their relationship with math creative problem solving ability. In addition the attribute patterns of high, medium show mathematical creative groups where identified and compared. The sample consisted of 409 fifth and sixth graders from two elementary schools in Taiwan .Tools used were math creative problem solving test, creativity assessment packet, critical thinking test level. The findings of the study showed three different patterns of attribute composition and the threshold effect on students creative problem solving . The CPSAI produced good internal consistence, good construct validity and marginated discriminant validity with data.

Evans (2012) conducted a study on "Problem solving ability and perceptions in alternative certification mathematics teacher". The purpose of the study was to understand alternative certification middle and high school teachers mathematical problem solving ability and perceptions. The sample consisted of 34 new teachers in the New York city teaching follows alternative certification program me enrolled in a graduate algebra content mathematics course for teachers that involved rigorous derivations and proofs . The major findings showed that teachers perceived their students problem solving ability as generally weak due to not understanding how to start a problem, lack of persistence and poor literacy skills.

Badak (2012) conducted a study on ‘’Mathematical profiles and Problem solving ability of mathematically promising students”. Objectives of the study were to find out the problem solving ability of mathematically promising students. The sample consisted of 400 students from an urban private school taking the first nineth ,tenth and fourteenth place. Findings of the study were the mathematically promising students were very determined, spent a long time in thinking, reflecting and planning. They found an authentic solution when they do not know or remember the general algorithm.

Friebele and David (2012) conducted a study on “Achievement in problem solving”. This action research project is meant to investigate the effects of incorporating research-based instructional strategies into instruction and their sub sequent effect on student achievement in the area of problem solving .The two specific strategies utilized are the integration of manipulative and increased social interaction on a regular basis.

Ozmutulu 2014 conducted a study on “Investigation of problem solving ability of students in school of physical education and sports (kafkas university sample)”. The objectives of the study were to examine the problem solving ability of school of physical education and sports students. The sample consisted of 433 students of the school of physical education and sports. The tool used were problem solving inventory .The statistical techniques used were, ANOVA test and mann-whitney and t-test. The findings of the study were the students of the school of physical education and sports have problem solving ability and there are no t- test factors in terms of gender, department, type of school and type of learning. There is a significant difference between the class factor and problem solving ability.

STYDIES RELATED TO ACHIEVEMENT IN CHEMISTRY

Harneek Kalie and Manjit kumar (1990) conducted a study on "Achievement motivation in relations to over and under-achievement in science and mathematics". The objectives of the study were, (i) To find out the relationship achievement motivation and achievement in science and mathematics .(ii)To find out whether over and under achievers in science and mathematics differ significantly in their achievement motivation The findings of the study were (i) Significant relationship does not exist between achievement motivation and achievement in science and mathematics.(ii) Over and under achievers in science do not differ significantly in their achievement motivation where as significant difference exists in the achievement motivation of over and under achievers in mathematics.

Mercy (1996) conducted study on "The relationships among students science achievement , elementary science teaching efficacy and school climate". The objectives of the study were (i).The results of the indicated that student science achievement is higher in school where the teachers have higher sense of science teaching efficacy. (ii).Science leaning in related to the school climate indices for institutional integrity, collegial leadership and academic emphasis .Finding of the study was the use of co-operative learning instructions strategy resulted in greater academic achievement and better attitude towards the science class of these students .

Ellakkakumar and Elankathirselvan (2001) conducted a study on "achievement motivation of higher secondary students and their achievement in physics". The objectives of the study were (i).To study the components of achievement motivation of higher secondary students in physics . (ii).To assess the achievement of higher secondary students in physics . (iii).To find

out whether there is any significant different between mean scores of any two components of achievement motivation scores of (a).The boys and the girls (b).The students studying in Tamil medium and the students studying in English medium.(c).Students studying in ' A ' groups and students studying in ' B ' groups .(iv)To find out whether there is any significant between the mean scores of achievement in physics of (a).The boys and the girls (b).The students studying in Tamil medium and the students studying in English medium. (c).Students studying in 'A' groups and students studying in ' B ' groups (v).To find out the nature of relationship between the components of achievement motivation of higher secondary students in physics. The finding of the study was this study has revealed achievement marks in physics were positivity related in all the sub-sample related motivation and unrelated motivation were negatively related in ll the sub sample .

Vimala kumari Amma (2003) conducted a study on "Attitude and Achievement in chemistry - A study on higher secondary students". The objectives of the study were,(i) To construct and standardize a scale to measure attitude towards chemistry.(ii) To find out the level of achievement in chemistry of higher secondary students.(iii)To find relationship between attitude and achievement in chemistry of higher secondary students. The findings of the study were,(i) The higher secondary students have favorable attitude towards chemistry.(ii) There is significant difference between the attitude of rural and urban students towards chemistry.(iii) Attitude and achievement in chemistry are positively and significantly with each other.

Bindu (2003) conducted a study on "Interest and Achievement in chemistry-A study on higher secondary students". The objectives of the study were, (i) to prepare chemistry interest inventory for higher secondary students. (ii) To find out the level of higher secondary students

interest in chemistry. (iii) To find out if there is any difference in higher secondary students achievement based on sex, locality, type of school and educational status of parents (iv) To find out the nature of relationship existing between the higher secondary students Interest and their achievement in chemistry is respect of the entire and its sub samples. The findings of the study were (i) the higher secondary students have interest in chemistry. (ii) There is significant difference between interest of male and female higher secondary school students. (iii) Higher secondary students are average in their achievement in chemistry. (iv) There is very high positive correlation exists between interest and achievement of higher secondary students.

Anice james and Marice**.** (2004) conducted a study on "Achievement in science as related to scientific aptitude and scientific attitude among XI th standard students in Tamil Nadu".The objectives of the study were, (i) To explore the relationship among the variables namely achievement in science, scientific aptitude and scientific attitude (ii) To investigate the association between (a) achievement in science (b) scientific aptitude (c) scientific attitude (iii)To examine whether achievement in science, scientific attitude differ due to variations in some selected variables. The findings of the study were, (i) There is a positive relationship between achievement in science and scientific aptitude where as achievement in science and scientific attitude are not related. (ii) There is significant gender difference in science achievement favoring girls. However boys and girls are on par in scientific aptitude and scientific attitude. (iii) Students hailing from rural and urban areas have similar scientific attitude and same type of academic achievement in science. But they differ in their scientific aptitude students from matriculation and state board schools have same type of achievement score in science but they differ in their scientific aptitude favoring students from matriculation schools. (iv)

There is significant association between (a) gender and science achievement (b) gender and scientific attitude where as no significant association is observed between achievement in science and scientific attitude.

Amaladoss Xavier and Amalraj (2004) conducted a study on "Achievement of higher secondary students in chemistry". The objectives of the study were (i) To study the achievement of higher secondary students in chemistry and its branches in terms of personal factors such as gender (ii) To study the achievement of higher secondary students in chemistry and its branches in terms of educational factors such as location of the school (iii) To study the achievement of higher secondary students in chemistry and its branches in terms of institutional factors such as location of the school .(iv) To study the significant difference in the achievement in chemistry and its branches in terms of background variables. The findings of the study were, (i) The level of achievement of students in chemistry is average (71.89%).(ii) The achievement of the students in inorganic chemistry is higher than that in other branches of chemistry .It has the highest score (95.11%). (iii) The achievement of students in chemistry and its branches in terms of gender is average .(iv) The achievement of female students in physical inorganic and organic chemistry is higher than that of male students . But the achievement of male students in chemistry into to is better that of female students . (v) The achievement of urban school students in physical, inorganic and organic chemistry into to is better that of rural students .(vi) The achievement of Tamil medium students in physical, inorganic and organic chemistry into to is better that of English medium students.

Angel Mary Jane (2006) conducted a study on "Test anxiety and achievement in chemistry- A study on higher secondary students" The objectives of the study were,(i) To

find out the level of test anxiety of higher secondary school students.(ii) To find out if there is any difference in higher secondary school student's test anxiety based on sex, locality and type of school.(iii)To find if there is any difference in higher secondary school students achievement in chemistry based on sex, locality and type of school .(iv) To study the relationship between text anxiety and achievement in chemistry of higher secondary school students. The sample consisted of 400 students. The findings of the study were,(i) The higher secondary students have moderate level of test anxiety. (ii) There is significant difference between the boys and girls in their text anxiety. (iii) Test anxiety and achievement in chemistry are negatively correlated with each other for the total sample.(iv) Test anxiety and achievement in chemistry are negatively correlated with each other for boys and girls.

Sivakumar, Minnel Kodi and Ponambal Thyagarajan (2007) conducted an "A study of achievement in science related to scientific aptitude and scientific attitude". The objectives of the study were (i) To investigate the relationship between achievement in science scientific aptitude and scientific attitude. The findings of the study were (i) All the information given in this study was relevant to make some important decision for the education to in calculate the scientific aptitude and attitude towards the student's community, as it is needed for the developing scientific and technological world. (ii) It is concluded that this study will be very useful to all of us, as we education think to improve the scientific environment among the students of the future.

Felix Rathi **(**2008) conducted a study on "Aspiration and achievement in chemistry – A study on twelth standard students". The objectives of the study were ,(i) To construct and validate an achievement test to measure the achievement in chemistry.(ii) To

measure the aspiration of twelth standard students by using the validated scale .(iii) To find out the relationship between aspiration and achievement of twelth standard students on the basis of total sample and sex. Normative survey method is used for the study . The sample consisted of 450 twelth standard students. The findings of the study were,(i) There exists significant relationship between aspiration and achievement in chemistry of twelth standard students.(ii) There exists significant relationship between aspiration and achievement in chemistry of twelth standard male and female students. (iii) There exists significant difference between male and female students in their aspiration females have more aspiration than male.

Ebenezer and Leo stanly (2009) conducted a study a study on "Adjustment and achievement in physics of XI standard students". The objectives of the study were (i) To find out the relationship between adjustment and achievement in physics of XI students in puducherry region.(ii) To find out the significant difference if any in the level of adjustment and in achievement in physics of class XI students in terms of their sex and type of school. The findings of the study were, (i) The level of adjustment of class XI students is low. (ii)The class XI students of pudcherry region do not differ significantly in their adjustment and achievement in physics.(iii) The adjustments of class XI students are influenced by sex and type of school. The level of adjustment of male students is higher than that of the female students. It is also found that there is a positive relationship between type of school chosen by the students and level of adjustment.

Sherly Navis (2010) made a study on "Chemistry learning environment and achievement in chemistry - A study on higher secondary students". The objectives of the study were, (i) To determine the higher secondary students precise their chemistry learning

environment .(ii) To find out the level of achievement in chemistry of higher students.(iii) To find out if there is any difference in higher secondary students perception of chemistry learning environment based on sex, locality type of school and caste . (iv) To find out if there is any difference in higher secondary students achievement in chemistry based on sex, locality type of school and caste . (v) To find out the relationship existing between the higher secondary students perceived chemistry learning environment and their achievement in chemistry in respect of the entire sample and its sub-samples, The findings of the study were (i) The higher secondary students have good perception of chemistry learning environment. (ii) The higher secondary school boys have good perception of chemistry learning environment . (iii) The higher secondary students are below average in their achievement in chemistry . (iv) Chemistry learning environment and achievement in chemistry of higher secondary students are positively correlated.

Mathew Prasanth (2014) studied the "Effect of curriculum based dynamic assessment on Achievement in chemistry of at-risk students". The objectives of the study were (i) To study the effect of curriculum based dynamic assessment model on achievement in chemistry at-risk students. (ii) To study the effect of curriculum based dynamic assessment model on achievement in chemistry of at-risk students. Experimental method was used for the study . The sample consisted of 96 at-risk students. The tool used were non-verbal group test of intelligence (J.C Pavan's standard progressive matrices) Lesson transcripts of curriculum based dynamic assessment model in chemistry developed by the investigator. The findings of study were The o study suggests curriculum based dynamic assessment as an effective model for enabling the at-risk students to reach higher level of performance through its pre – test intervene retest format.

Babu (2011) conducted a study on "Higher secondary students Achievement in chemistry in relation to their study habits". The objectives of the study were (i) To find out the higher secondary school students study habits and achievement in chemistry (ii) To find out whether there is significant difference achievement in chemistry and study habits based on gender, locality and type of school students. The sample consisted of 565 higher secondary students from Cuddalore district .The tool used was study habit inventory constructed and standardized by Dr.Gopal Rao . The findings of the study were (i) There is significant difference between rural and urban students Achievement in chemistry and study habits. (ii)There is no significant difference between the male and female students in their achievement in chemistry and study habits.

Kanaga Raj (2011) conducted a study on "Thinking styles and Achievement in chemistry -A study on higher secondary school students". The objectives of the study were (i) To find out the prominent thinking styles among higher secondary students .(ii) To find out the prominent thinking styles of higher secondary school students based on the high and low achievement level. Normative survey method was used for the study . The sample consisted of 300 higher secondary school students . The tool used were general data sheet and Thinking style inventory (developed by Sternberg and wagner (1991) . The statistical techniques used for the analysis of data were mean ,S.D, t-test and chi-square test The findings of the study were (i) The preferred thinking style among higher secondary school students. (ii) There is no significant different between high and low achievers in local thinking styles and achievement in chemistry.

Mani (2013) conducted a study on "Influence of emotional intelligence on achievement in chemistry among higher secondary students". The objective of the study was to find out the Influence of Emotional intelligence on achievement in chemistry of higher

secondary students . Normative survey method was used for the study .The sample consisted of 500 higher secondary students The findings of the study were . The study indicates the existence of significant positive relationship between emotional intelligence and achievement in chemistry of higher secondary students.

Wachanga (2013) conducted a study on" Effect of advance organizer teaching approach secondary school students on Achievement in chemistry in Marara district ,Kenya". The objectives of the study were (i) To determine whether the achievement of students who are taught through advance organizer teaching approach would be different from that of those taught using the regular teaching method. (ii) To determine whether students achievement was affected by gender when they are taught through advance organizer teaching approach .The sample consisted of 161 secondary school students .The statistical techniques used for the analysis of the data were mean, standard deviation, ANOVA and t-test . The findings of the study were (i) There is no statistically significant difference in achievement score in chemistry between students who are taught using advance organize teaching approach and those who are taught using regular teaching methods (ii) There is no statistically significant difference in achievement in chemistry between boys and girls who are taught using Advance organize teaching approach

Mani (2013) conducted a study on "Influence of home environment on Achievement in chemistry among higher secondary students". The objectives of the study were (i) To find out the significant relationship between home environment and achievement in chemistry of higher secondary students.(ii) To find out the predictive efficiency of overall home environment and its dimensions on achievement in chemistry of higher secondary students .Normative survey method was used for the study . The sample consisted of 500 students studying in higher secondary students in Dindigul district. The tools used were Family environment scale

constructed and standardized by Harpreet Bhatia and N.K chadha (1996) and. Achievement test in chemistry constructed and validated by the investigators . The findings of the study were (i) There is no significant correlation between achievement in chemistry and home environment of higher secondary students .(ii) The overall home environment and its dimensions do not contribute for achievement in chemistry of higher secondary students.

Joseph Raj (2014) conducted a study on "Stress coping ability and achievement in chemistry of higher secondary students of Cuddalore district".The objectives of the study were (i) To study the level of stress coping ability and achievement in chemistry of higher secondary students (ii) To study if there is significant difference among the higher secondary students stress coping ability and achievement in chemistry in respect to sub samples The sample consisted of 600 higher secondary students in Cuddalore district. The tool used was stress coping ability score constructed and standardized by the investigator scale . The findings of the study were (i) stress coping ability and achievement in chemistry of higher secondary students is high .(II) There is no significant difference among the higher secondary students stress coping ability and achievement in chemistry in respect to sub samples.

Chapter -III

METHODOLOGY

- **METHOD ADOPTED**
- **TOOLS USED**
- **SAMPLE FOR THE STUDY**
- **STATISTICAL TECHNIQUES USED.**

Research may be defined as the application of scientific method in the study of problems. Research is endless quest for knowledge or unending search for truth. It brings to light new knowledge or corrects previous to light new knowledge or corrects previous errors and misconceptions and adds in orderly way to the existing body of knowledge. The knowledge obtained by research is scientific and objective. According to J.W. best (1998), "research is considered to be the more formal, systematic, intensive process of carrying on the scientific method of analysis. It involves a more systematic structure of investigation

usually, resulting in some sort of formal record or procedures and a report of result or conclusion.

Educational research involves an application of the main principles of scientific research to find the solution for educational problems according to J.W. Best "Educational research is that activity which is directed towards development of science of behavior in educational situations". (cook)"Research is an honest , exhaustive , intelligent searching for facts and their meanings or implications with reference to a given problem. It is the process of problems through the planned and interpretation of data . the best research is that which is reliable, verifiable and exhaustive so that it provides information in which we have confidence".

Mouly has classified research methods in to three basic types.

i) Historical method

ii) Normative survey method

iii) Experimental method.

METHOD ADOPTED

The present study attempts to find out the relationship between Problem solving ability and achievement in chemistry of higher secondary students. Since the problem is concerned with the survey type, the investigator has selected the normative survey method for conducting the study.

Normative survey method

Normative Survey Method is that method of investigation which attempts to describe and interpret what exist at present in the form of conditions , practices , processes trends , effects , attitudes, beliefs etc . If is an organized attempt to analyze , interpret and report the present status of a social institution , group or area.

The word survey indicates the gathering of the data regarding current Conditions .The word "Normative " is used because survey are frequently made for the normal or typical condition or practice .

George J.Mouly has said , No category of educational research in more widely used than the type know variously as the survey . The normative survey , status anddescriptive research . The broad classification comparisons as variety of specific techniques and procedures, all similar from the stand point of the phenomenon under investigation.

Characteristics of survey method

- It gathers data from a relatively large number of cases.
- It is essentially cross-sectional
- It provides information useful to the solution of local problems.
- Survey may be qualitative or quantitative
- Descriptions resulting from survey may be either verbal or expressed in mathematical symbols.
- It is more realistic
- It requires careful analysis and interpretation of the data.

- It requires expert imaginative planning.
- It requires logical skillful reporting of the findings
- It is conducted in natural setting.

Purpose and uses of survey method

- Although the major purpose of surveys method in research is to tell what is? ie, to describe the problem or phenomenon but many survey to beyond a more description of the existing situation.

- Descriptive surveys or normative surveys are often out a preliminary steps to be followed by researcher employing more vigorous control and more objective method.

- Descriptive surveys or studies also serve as direct source of valuable knowledge concerning human behavior
- Descriptive surveys as direct source of valuable knowledge concerning human behaviours.

TOOLS USED

For collecting the data required for the study one may have to use various scientific devices. These devices employed as means are called tools. Tools are the instruments that help the research to gather data .The selection of suitable tool is of great importance for successful research. The investigator used the following tools for the collection of data

a) Problem solving ability test, Prepared by

R.P.Deepa & Dr.M.Sadanandan (2010-2011)

b) General data sheet

c) As a measure of achievement in chemistry marks obtained by the students in half yearly examination was taken.

a)Problem solving ability test

Problem solving ability test was prepared by R.P Deepa & Dr.M..Sadanandan (2010-2011).This test aimed at measuring ability in problem solving. The test consisted of three areas namely mathematical formulation. Arithmetic reasoning and numerical ability. This test consists of 58 Questions. The questions were multiple choice type and for each question four answers were given. The reliability coefficient of the test was found to be 0.856 .

A copy of the Problem Solving Ability test is given as Appendix –A

Scoring

For each correct response one mark was given and for each wrong response zero mark was given. A scoring key was used by the investigator for easy and quick scoring.

b)General data sheet

The General Data Sheet serves to collect information about personal information such as gender, locality , religion , type of management and community

A copy of the general data sheet is given as Appendix-B

THE SAMPLE

Sampling involves the selection of a new items from a particular group to be studied with a view to obtain relevant data which help in drawing conclusions regarding the entire group. The total group from which the sample was selected is called population.

The sample for the present study consisted of 400 higher secondary students in different schools of kanayakumari district. Investigator has adopted stratified random sampling method. The details of the sample selected is given in table. 3.1

Table :3.1

Details Regarding the sample selected

S.No	Name of the school	Total
1.	Seventh day Adventist Metric Higher Secondary School, Thiruvattar	33
2.	SRKSV. Metric Higher Secondary School, Kulasekharam	35
3.	Islamic ModelMetric High Secondary School Thiruvithancode	39
4.	Govt. Higher Secondary School, Thuckalay	30
5.	Pius XI Higher Secondary School, Thoothoor	19
6.	ABC Metric Higher Secondary School, Kollemcode	43
7.	St. Francis Higher Secondary School, Vavari	27
8.	Govt. Higher Secondary School, Eraniel	40
9.	Govt. Higher Secondary School, Karungal	32
10.	St. Mary Higher Secondary School, Colachel	49
11.	Govt. Higher Secondary School. Munchirai	53

Table :3.2

Distribution of the sample on the basis of background variables

Back ground variables	Category	Count
Gender	Male	226
	Female	174
Locality	Rural	222
	Unban	178
Type of Management	Government	158
	Aided	92
	Unaided	50
Religion	Hindu	148
	Christian	198
	Muslim	54
Community	Backward caste	305
	Most Backward caste	57
	Scheduled caste	38

Data collection procedure

Data were collected from 400 higher secondary students. For this purpose the investigator visited eleven schools as per the schedule fixed . The investigator sought permission from the heads of institution for administering the tool.

Before administering the tool the investigator explained the purpose of her study. A copy of general data sheet and problem solving ability test were distributed to the students and the response sheets were collected from the respondents after marking there responses.

STATISTICAL TECHNIQUES USED

The following are the statistical techniques employed for the present study

1. Arithmetic Mean
2. Standard Deviation
3. t – test
4. ANOVA
5. Pearson's product moment coefficient of correlation

1. Arithmetic Mean

$$X = A + \frac{\sum fd}{N} \times c$$

Where,

X = Arithmetic Mean

A = Assumed Mean of the scores

f = Frequency of the scores

d = deviation from the mean

N = Total sample

c = Class interval of the scores

2. Standard deviation

$$\sigma = \sqrt{\frac{\sum fd^2}{N} - \frac{\left(\sum fd\right)^2}{N}} \times c$$

Where,

c = Length of the class interval

d = Deviation of the scores assumed mean

f = frequency of each class

N = Total sample

3. t-test

$$t = \frac{M_1 - M_2}{\sqrt{\frac{\sigma_1^2}{N_1} - \frac{\sigma_2^2}{N_1}}}$$

where,

M_1 = Arithmetic mean of 1st sample

M_2 = Arithmetic mean of 2nd sample

σ_1 = Standard deviation of 1st sample

σ_2 = Standard deviation of 2nd sample

N_1 = Number of students in 1st group

N_2 = Number of students in 2nd group

4.Pearson's product moment coefficient of correlation

$$r = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2}\sqrt{N\sum Y^2 - (\sum Y)^2}}$$

Where,

N = Number of scores.

$\sum X$ = Sum of the X scores.

$\sum Y$ = Sum of the Y scores.

$\sum X^2$ = Sum of the X scores squared.

$\sum Y^2$= Sum of the Y scores squared.

$\sum XY$ = Sum of the X products of paired X and Y scores.

5. ANOVA (Analysis of Variance/F-test)

$$F = \frac{\text{Mean square variance between groups}}{\text{Mean square variance with in groups}}$$

$$= \frac{Vb}{Vw}$$

where,

Vb = Mean square variance between groups

Vw = Mean square variance with in groups

Chapter -IV

ANALYSIS AND INTERPRETATION

The analysis and interpretation of data is one of the important steps in research process . It is the application of deductive and inductive logic to examine critically the results obtained in the light of the previous studies.

Analysis of data means studying the tabulated materials in order to determine the inherent facts or meanings .It involves breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purpose of interpretation .Thus the term analysis refers to computation of certain measures along with the searching of patterns of relationship that exists among the data group. Interpretation of data calls for the critical examination of the results of ones analysis in the light of all limitations of the data gathering

According to Francis Rummel,, "the analysis and interpretation of data involves the objective materials in the possession of the researcher and his subjective reaction and desires to derive from the data , the inherent meanings in their relation to the problem . The problem should be analyzed in detail to see what data are necessary in its solution and to be assured that the methods used will provide for definite answers . The researcher must determine whet ere or not the factors chosen for study will satisfy all the conditions of the problem and if the sources to be used will provide the requisite data".

In the present study the data collected were analyzed using the following statistical techniques .

1 . Arithmetic mean

2 . Standard deviation

3 . t-test

4. ANOVA

5 . Pearson's product moment correlation

PART -I

A.PROBLEM SOLVING ABILITY SCORES

1.PROBLEM SOLVING ABILITY SCORES OF HIGHER SECONDARY STUDENTS (TOTAL SAMPLE)

The mean and standard deviation of problem solving ability scores of 400 higher secondary students are given in table. 4.1

Table : 4.1

MEAN AND STANDARD DEVIATION OF PROBLEM SOLVING ABILITY SCORES OF TOTAL SAMPLE

Number	Mean	S.D
400	16.16	4.55

The arithmetic mean was found to be 16.16 out of a total of 58. This indicates that higher secondary students have low problem solving ability . The value obtained for standard deviation is 4.55 .This value shows that there is scattering of scores from the mean score .

Table :4.2

2 . PERCENTAGE DISTRIBUTION OF DIFFERENT LEVELS OF PROBLEM SOLVING ABILITY.

Problem solving ability	count	percent
Low	59	14.75
Medium	271	67.75
High	70	17.50

Total	400	100.00

From the above table it is clear that the number of student according to low, medium and high levels of problem solving ability were 59,271 and 71 and the corresponding percentages were 14.75, 67.75 and 17.50 respectively. This indicates the most of the higher secondary students have medium level of problem solving ability .

3.PROBLEM SOLVING ABILITY SCORES OF BOYS AND GIRLS

The mean and standard deviation of problem solving ability scores of Male and Female students are give in table. 4.3

Table :4.3

MEAN AND STANDARD DEVIATION OF PROBLEM SOLVING ABILITY SCORES OF MALE AND FEMALE HIGHER SECONDARY STUDENTS

Category	**Number**	**Mean**	**S.D**
Male	226	15.60	4.21
Female	174	16.90	4.86

The mean values obtained by male and female higher secondary students were 15.60 and 16.90 respectively out of a total of 58 . This shows that male and female higher secondary students have low problem solving ability . The values obtained for standard deviation were 4.21 for boys and 4.86 for girls . These values show that there is scattering of scores from the mean score.

4.PROBLEM SOLVING ABILITY SCORES OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

The mean and standard deviation of problem solving ability scores of rural and urban higher secondary students are given in table.4.4

Table :4.4

MEAN AND STANDARD DEVIATION OF PROBLEM SOLVING ABILITY SCORES OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

Category	Number	Mean	S.D
Rural	222	16.3	4.54
Urban	178	15.99	4.56

The mean values obtained by rural and urban higher secondary students were 16.3 and 15.99 respectively out of a total of 58 . This shows that both rural and urban higher secondary students have low problem solving ability . The values obtained for standard deviation were 4.54 for rural students and 4.56 for urban students . These values show that there is scattering of scores from the mean score.

5.PROBLEM SOLVING SCORES OF GOVERNMENT AIDED AND UNAIDED HIGHER SECONDARY STUDENTS

The mean and standard deviation of problem solving ability scores of government aided and unaided higher secondary students are given in table.4.5

Table: 4.5

MEAN AND STANDARD DEVIATION OF PROBLEM SOLVING ABILITY SCORES OF GOVERNMENT AIDED UNAIDED HIGHER SECONDARY SCHOOL STUDENTS

Category	Number	Mean	S.D
Government	158	15.97	4.4
Aided	92	15.68	4.62
Unaided	150	16.66	4.63

The mean values obtained by government ,aided and unaided higher secondary students were 15.97, 15.68 and 16,66 respectively out of a total of 58 . This shows that government aided and unaided higher secondary school students have low problem solving ability . The values obtained for standard deviation were 4.4 for government, 4.62 for aided and

4.63 for unaided higher secondary students . These values show that there is scattering of scores from the mean score.

6. PROBLEM SOLVING ABILITY SCORES OF BACKWARD CASTE, MOST BACKWARD CASTE AND SCHEDULED CASTE HIGHER SECONDARY STUDENTS

The mean and standard deviation of problem solving ability scores of backward caste, most backward caste and scheduled caste higher secondary students are given in table .4.6

Table :4.6

MEAN AND STANDARD DEVIATION OF PROBLEM SOLVING ABILITY SCORES OF BACKWARD CASTE MOST BACK WARD CASTE AND SCHEDULED CASTE HIGHER SECONDARY STUDENTS

Category	Number	Mean	S.D
Backward caste	305	16.01	4.41
Most backward caste	57	15.51	4.02
Scheduled caste	38	18.37	5.7

The mean values obtained by Backward caste, Most back ward caste and Scheduled caste higher secondary students were 16.01 ,15.51 and 18.37 respectively out of a total of 58 . This shows that both Backward caste Most back caste and Scheduled caste higher secondary students have low problem solving ability . The values obtained for standard deviation were 4.41 for Backward caste students and 4.02 for Most back ward caste students and 5.7 for Scheduled caste students . These values show that there is scattering of scores from the mean score.

B. COMPARISON OF PROBLEM SOLVING ABILITY SCORES OF VARIOUS GROUPS

1.COMPARISON OF PROBLEM SOLVING ABILITY OF MALE AND FEMALE HIGHER SECONDARY STUDENTS

The t- value was calculated to find out the influence of gender on problem solving ability of higher secondary students . The mean , standard deviation and t -value are presented in table .4.7

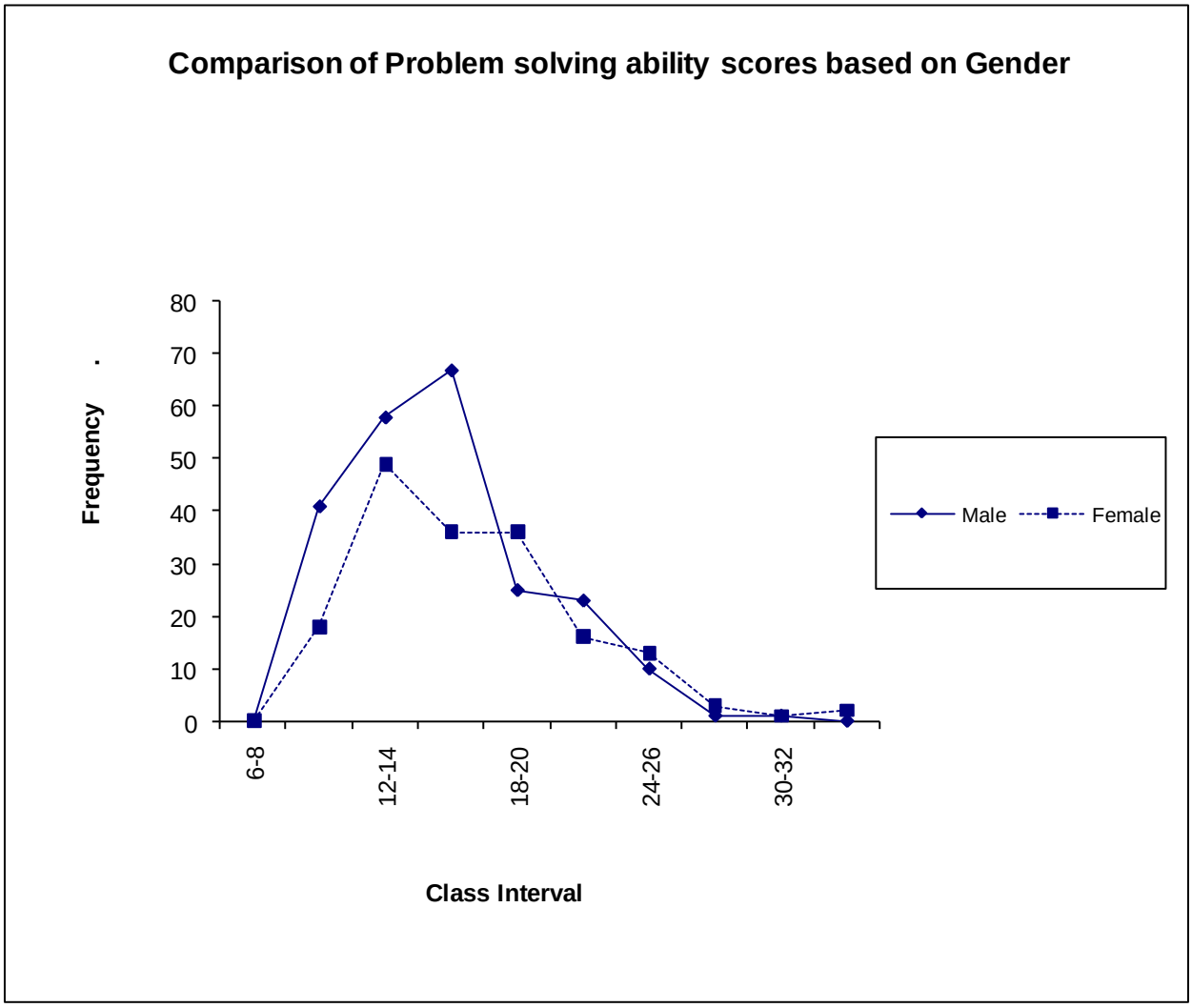
Table :4:7

MEAN, STANDARD DEVIATION AND t - VALUE OF PROBLEM SOLVING ABILITY SCORES OF MALE AND FEMALE HIGHER SECONDARY STUDENTS

Gender	Mean	S.D	N	t	P	Level of significance
Male	15.60	4.21	226	2.809	0.005	Significant at 0.01 Level
Female	16.90	4.86	174			

The obtained t-value (2.809) is significant at 0.01 level . This result indicates that there is significant difference between the male and female higher secondary students in their problem solving ability. So it can be concluded that gender has influence on problem solving ability of higher secondary students .The comparison of scores is graphically presented in figure.4.1

Figure :4.1


Comparison of Problem solving ability scores based on Gender
Frequency
80
70
60
50
40
30
20
10
0
6-8
12-14
18-20
24-26
30-32
Class Interval
Male
Female

2. COMPARISON OF PROBLEM SOLVING ABILITY SCORES OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

The t – value was calculated to find out the influence of locality on problem solving ability of higher secondary students . The mean , standard deviation and t - value are presented in table .4.8

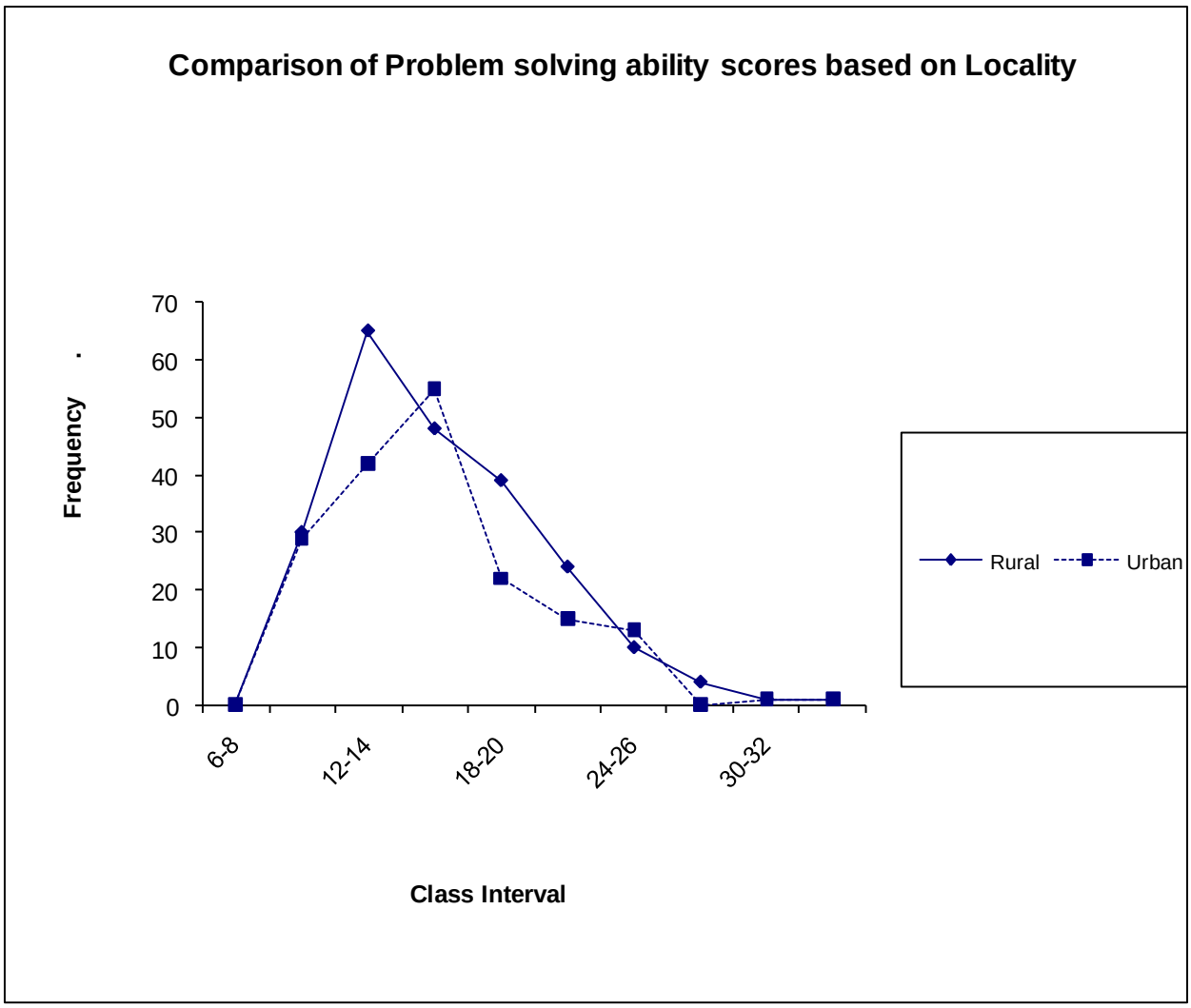
Table :4.8

MEAN STANDARD DEVIATION AND t - VALUE OF PROBLEM SOLVING ABILITY SCORES OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

Locality	Mean	S.D	N	t	P	Level of significance
Rural	16.3	4.54	222	0.677	0.499	Not significant
Urban	15.99	4.56	178			

The obtained t-value (0.677) is not significant at any level . This indicates that there is no significant difference between the rural and urban higher secondary students in their problem solving ability . so it can be concluded that locality has no influence on problem solving ability of higher secondary students . The comparison of scores is graphically presented in figure.4.2

Figure:4.2


Comparison of Problem solving ability scores based on Locality
Frequency
70
60
50
40
30
20
10
0
6-8
12-14
18-20
24-26
30-32
Class Interval
Rural
Urban

3. COMPARISON OF PROBLEM SOLVING ABILITY SCORES OF HIGHER SECONDARY STUDENTS CLASSIFIED ON THE BASIS OF TYPE OF MANAGEMENT

The F – value was calculated to find out the influence of Type of management on problem solving ability of higher secondary students . The mean , standard deviation and F-value were presented in table .4.9

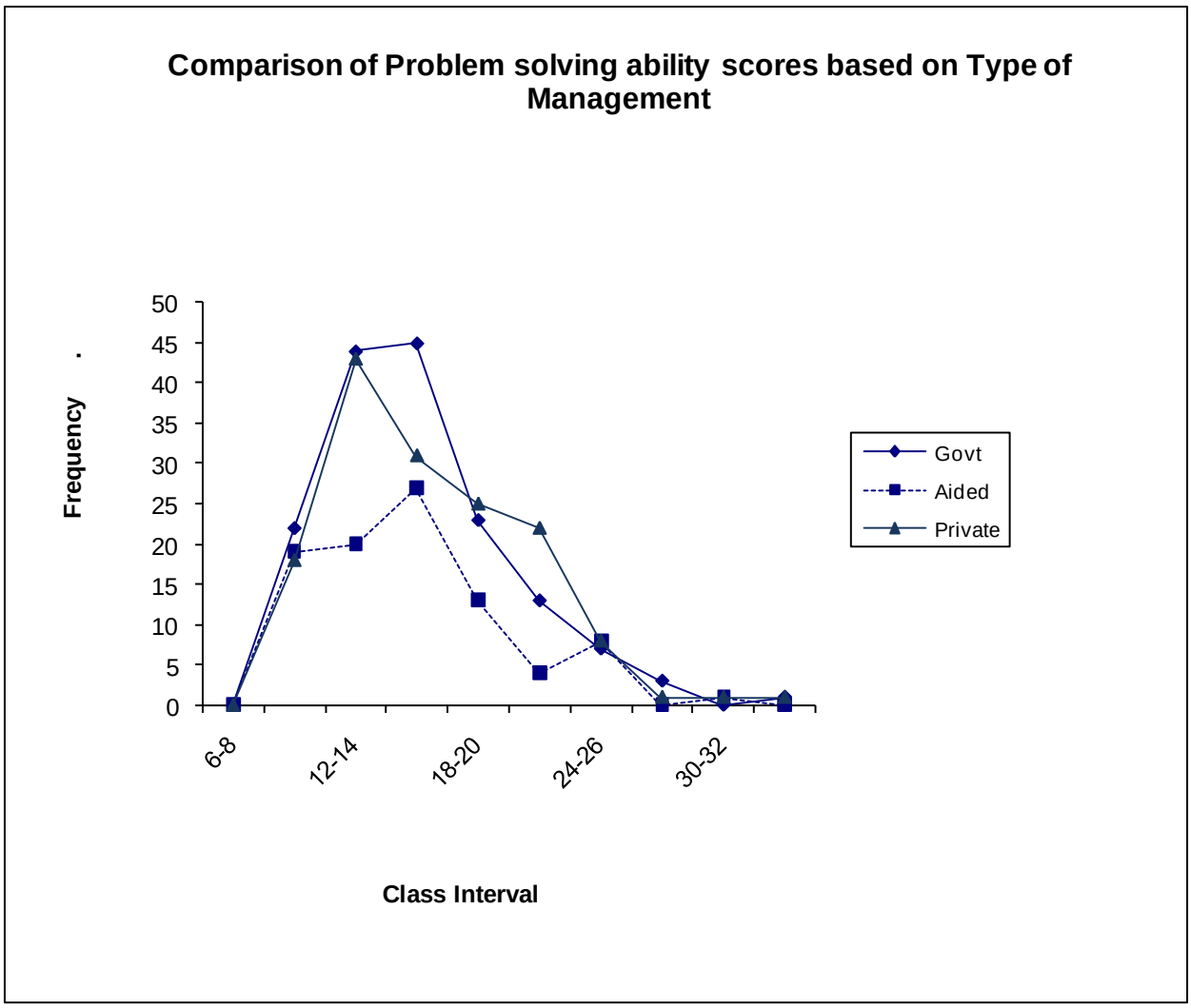
Table :4.9

MEAN STANDARD DEVIATION AND F - VALUE OF PROBLEM SOLVING ABILITY SCORES OF HIGHER SECONDARY STUDENTS BELONGING TO VARIOUS TYPES OF MAMAGEMENT

Type of Management	Mean	S.D	source	Sum of squares	df	Mean square	F	P	Level of significance
Government	15.97	4.4	Between GP	64.08	2	32.04	1.555	0.212	Not significant
Aided	15.68	4.62	With in GP	8178.36	397	20.60			
Unaided	16.66	4.63	Total	8242.44	399				

The obtained F – value (1.555) is not significant at any level . This results indicates that there is no significant difference in the problem solving ability of higher secondary students belonging to various types of management . So it can be concluded that type of management has no influence on the problem solving ability of higher secondary students. . The comparison of scores is graphically presented in figure.4.3

Figure:4.3


Comparison of Problem solving ability scores based on Type of Management
Frequency
50
45
40
35
30
25
20
15
10
5
0
6-8
12-14
18-20
24-26
30-32
Class Interval
Govt
Aided
Private

4.COMPARISON OF PROBLEM SOLVING ABILITY SCORES OF HIGHER SECONDARY STUDENTS CLASSIFIED ON THE BASIS OF COMMUNITY

The F -value was calculated to find out the influence of community on problem solving ability of higher secondary students . The mean , standard deviation and F- value are presented in table.4.10

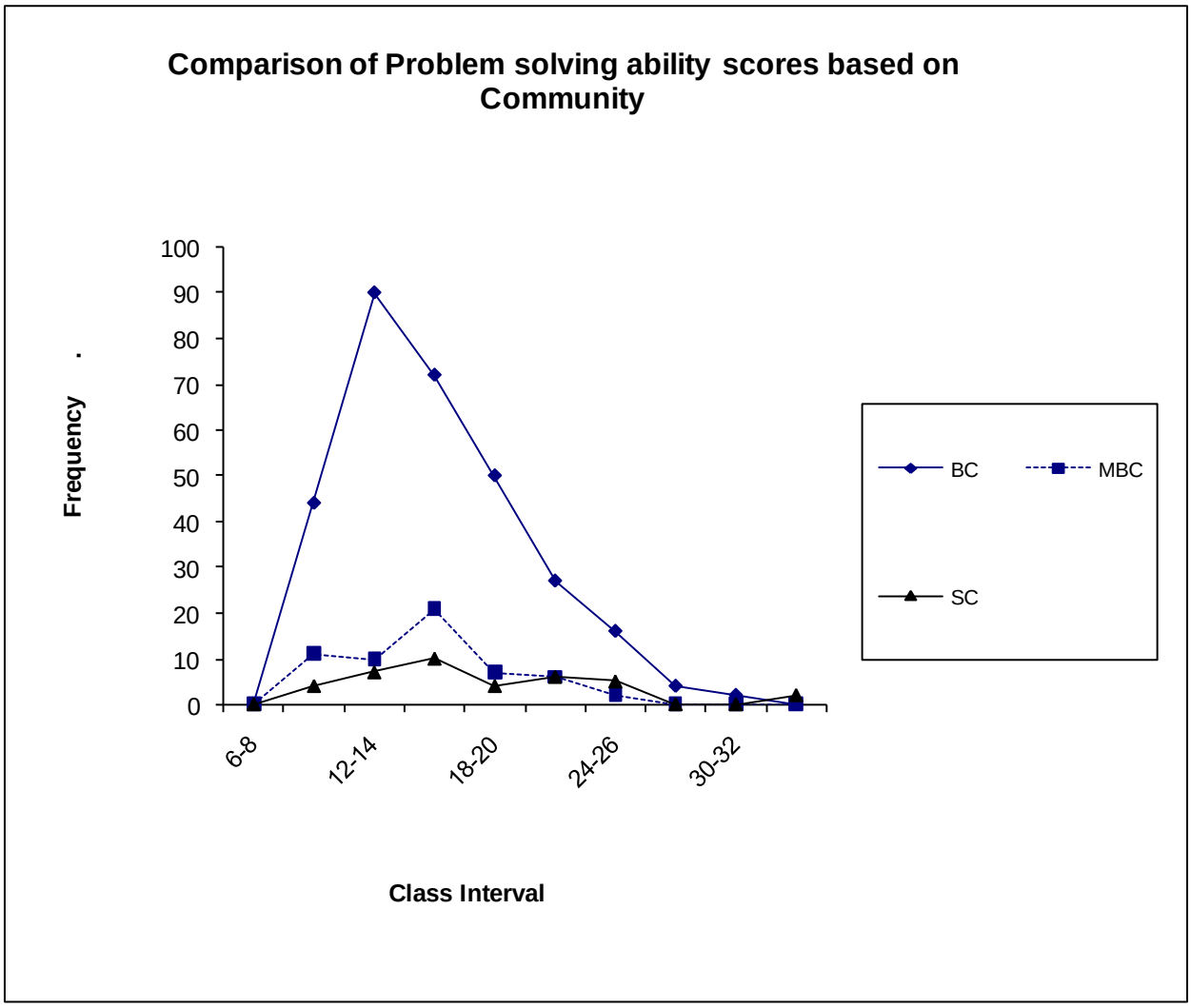
Table :4.10

MEAN STANDARD DEVIATION AND F - VALUE OF PROBLEM SOLVING ABILITY SCORES OF HIGHER SECONDARY STUDENTS BELONGING TO VARIOUS COMMUNITIES

Community	Mean	SD	Source	Sum of squares	df	Mean square	F	p	Level of significance
Backward caste	16.01	4.41	Between GP	216.38	2	108.19	5.351	0.005	Significant at 0.01 level
Most backward caste	15.51	4.02	Within GP	8026.06	397	20.22			
Scheduled caste	18.37	5.7	Total	8242.44	399				

The obtained F –value (5.351) is significant at 0.01 level . This results indicates that there is significant difference between the higher secondary students belonging to various communities in their problem solving ability . So it can be concluded that community has influence on the problem solving ability of higher secondary students. The comparison of scores is graphically presented in figure.4.4

Figure:4.4


Comparison of Problem solving ability scores based on Community
Frequency
100
90
80
70
60
50
40
30
20
10
0
6-8
12-14
18-20
24-26
30-32
Class Interval
BC
MBC
SC

The result does not help to identify exactly the pairs of group which differ significantly . Hence scheffe's multiple comparison is used for further analysis . Results of scheffe's procedure is given in table.4.11

Table:4.11

RESULTS OF SCHEFFE'S PROCEDURE

Community	N	Pair	P (Scheffe)	Level of significance
Backward caste(A)	305	A vs B	0.743	Not significant
Most backward caste (B)	57	B vs C	0.010	Significant at 0.01 Level
Scheduled caste (C)	38	A vs C	0.010	Significant at 0.01 Level

The result showed that there is no significant difference between Backward caste and Most backward caste higher secondary school students in their problem solving ability . The other pairs Most backward caste and Scheduled caste ,Backward caste and Scheduled caste higher secondary school students differ significantly in their problem solving ability

PART –II

CHEMISTRY ACHIEVEMENT SCORES

CHEMISTRY ACHIEVEMENT SCORES OF HIGHER SECONDARY STUDENTS

The chemistry achievement scores of 400 higher secondary students were computed for mean and standard deviation . The values are given in table .4.12

Table:4.12

MEAN AND STANDARD DEVIATION OF CHEMISTRY ACHIEVEMENT SCORES OF HIGHER SECONDARY STUDENTS

S.no	Category	N	Mean	SD
1.	Total sample	400	110.55	25.80
2.	Male	226	109.07	25.41
3.	Female	174	112.47	26.25
4.	Rural	222	112.83	25.01
5.	Urban	178	107.71	26.55
6.	Government	158	106.84	24.86
7.	Aided	92	108.77	27.9
8.	Un aided	150	115.55	24.79
9.	Backward caste	305	109.93	25.46
10.	Most backward caste	57	108.65	28.45
11.	Scheduled caste	38	118.39	23.58

The maximum score is 200 the mean of the total sample is 110.55 .This indicates that higher secondary students are average in their achievement in chemistry.

From the table it is clear that female students show better achievement in chemistry compared to male students.

Rural students show better achievement in chemistry compared to urban students.

Un aided school students show better achievement in chemistry compared to aided and government school students.

Scheduled caste students show better achievement in chemistry compared to backward caste and most backward caste students.

The values obtained for standard deviation show that there is scattering of scores from the mean score.

COMPARISON OF CHEMISTRY ACHIEVEMENT SCORES OF VARIOUS GROUPS

The chemistry achievement scores of different groups of higher secondary students have been compared independently as shown below.

1.COMPARISON OF CHEMISTRY ACHIEVEMENT SCORES OF MALE AND FEMALE STUDENTS

The t- value was calculated to find out the influence of gender on achievement in chemistry of higher secondary students. The mean, standard deviation and t- value are presented in table.4.13

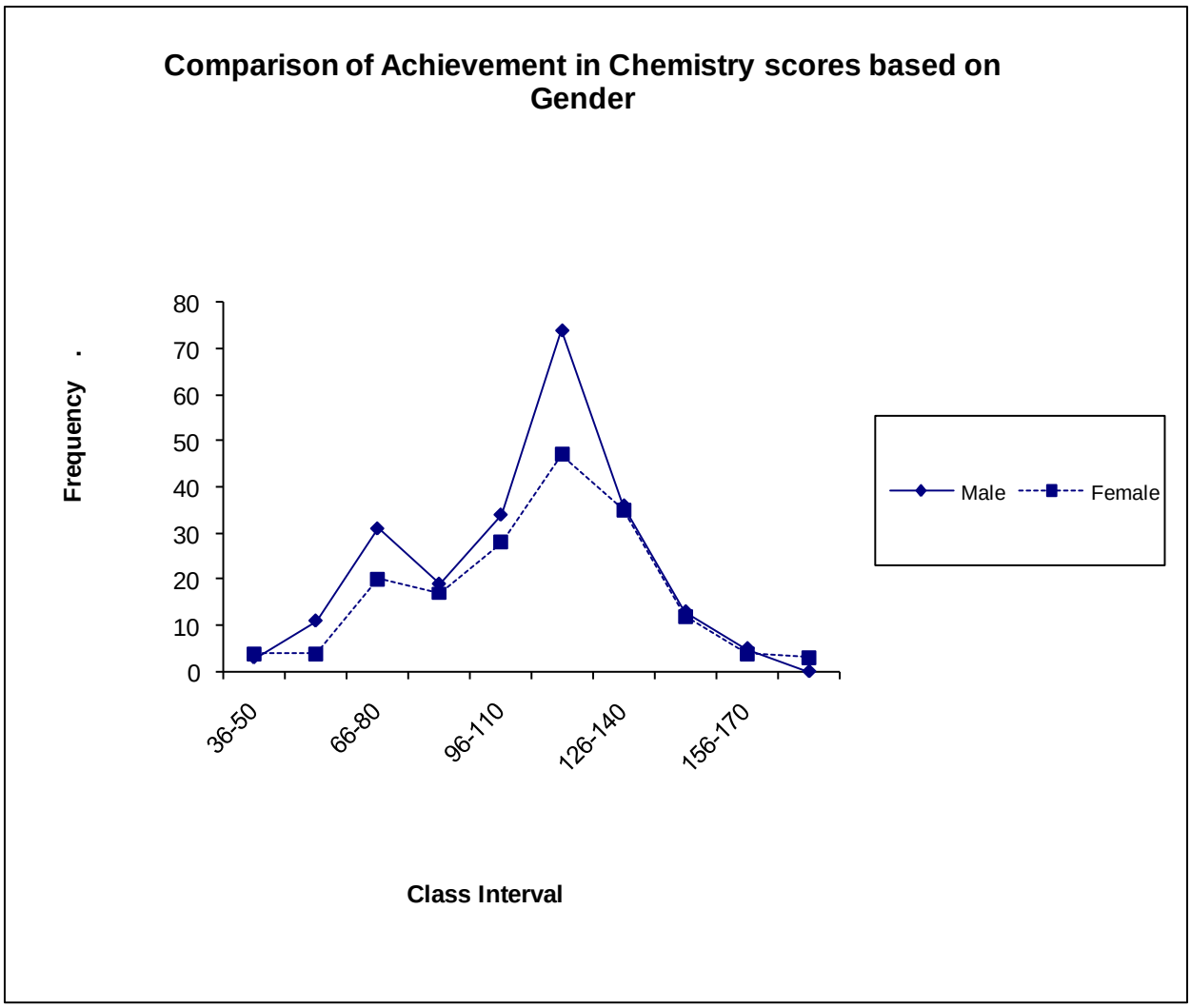
Table:4.13

MEAN STANDARD DEVIATION AND t- VALUE OF ACHIEVEMENT SCORES IN CHEMISTRY OF MALE AND FEMALE STUDENTS

Gender	Mean	SD	N	t	p	Level of significance
Male	109.07	25.41	226	1.302	0.194	Not significant
Female	112.47	26.25	174			

The obtained t – value (1.302) is not significant at any level. This result indicates that there is no significant difference between the male and female higher secondary students in their achievement in chemistry. So it can be concluded that gender has no influence on achievement in chemistry of higher secondary students. The comparison of scores is graphically presented in figure.4.5

Figure:4.5


Comparison of Achievement in Chemistry scores based on Gender
Frequency .
80
70
60
50
40
30
20
10
0
36-50
66-80
96-110
126-140
156-170
Class Interval
Male
Female

2. COMPARISON OF CHEMISTRY ACHIEVEMENT SCORES OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

The t- value was calculated to find out the influence of locality on achievement in chemistry of higher secondary students. The mean, standard deviation and t- value are presented in table.4.14

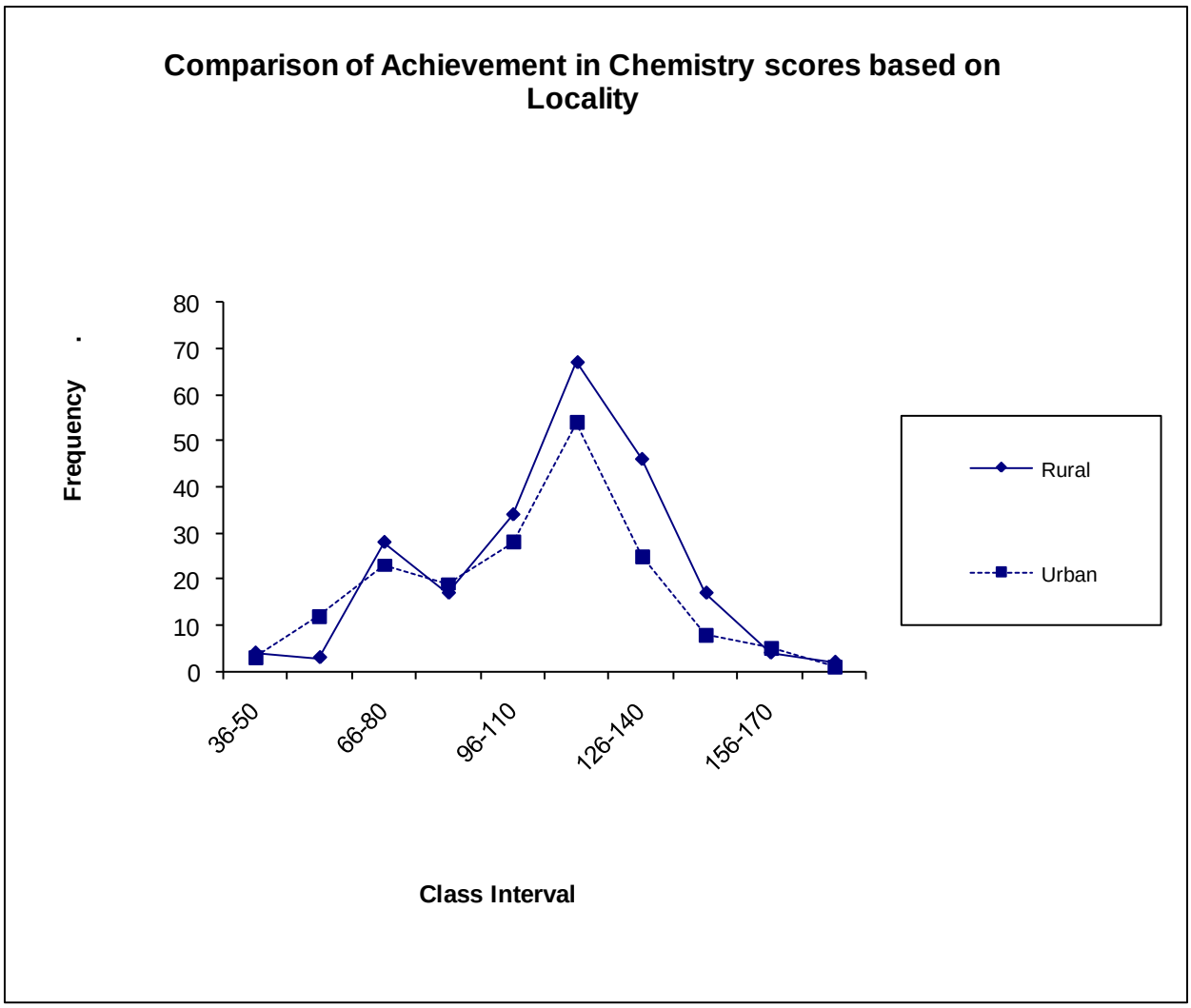
Table:4.14

MEAN STANDARD DEVIATION AND t- VALUE OF ACHIEVEMENT SCORES IN CHEMISTRY OF RURAL AND URBAN HIGHER SECONDARY STUDENTS

Locality	Mean	SD	N	t	p	Level of significance
Rural	112.83	25.01	222	1.967	0.050	Significant at 0.05 level
Female	107.71	26.55	178			

The obtained t – value (1.967) is significant at 0.050 level. This result indicates that there is significant difference between the rural and urban students in their achievement in chemistry. So it can be concluded that the locality has influence on achievement in chemistry of higher secondary students. The comparison of scores is graphically presented in figure.4.6

Figure:4.6


Comparison of Achievement in Chemistry scores based on Locality
Frequency .
80
70
60
50
40
30
20
10
0
36-50
66-80
96-110
126-140
156-170
Class Interval
Rural
Urban

3.COMPARISON OF CHEMISTRY ACHIEVEMENT SCORES OF GOVERNMENT,AIDED AND UNAIDED HIGHER SECONDARY STUDENTS

The F- value was calculated to find out the influence of type of management on achievement in chemistry of higher secondary students. The mean, standard deviation and F-value are presented in table.4.15

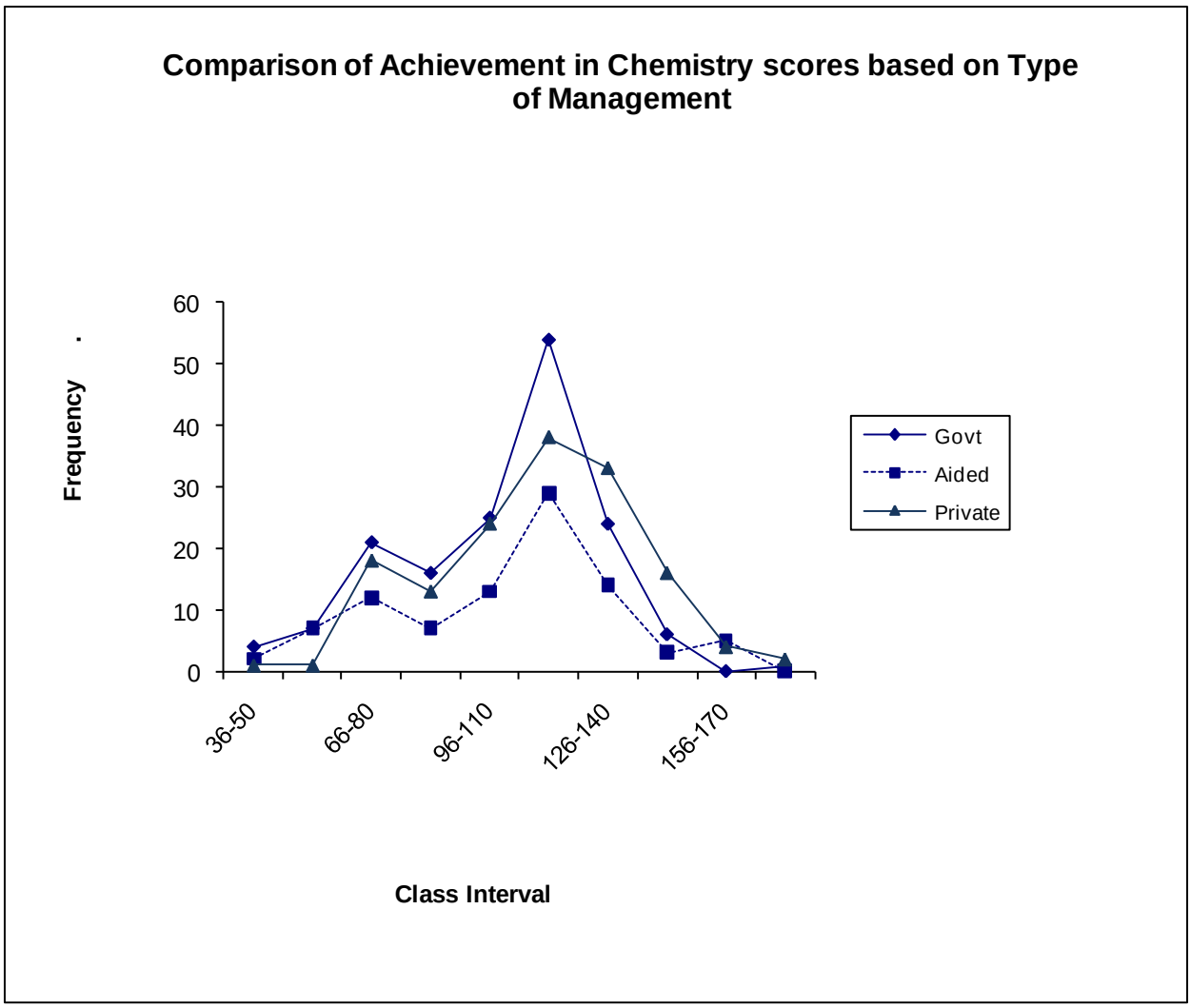
Table:4.15

MEAN STANDARD DEVIATION AND F- VALUE OF ACHIEVEMENT SCORES IN CHEMISTRY OF GOVERNMENT ,AIDED AND UNAIDED HIGHER SECONDARY STUDENTS

Type of Management	Mean	S.D	source	Sum of squares	df	Mean square	F	P	Level of significance
Govern Ment	106.84	24.86	Between GP	6226.00	2	3113.00	4.764	0.009	Significant at 0.01 level
Aided	108.77	27.9	With in GP	259413.00	397	653.43			
Unaided	115.55	24.79	Total	265639.00	399				

The obtained F– value (4.764) is significant at 0.01 level. This result indicates that there is significant difference between the higher secondary students belonging to various types of management in their achievement in chemistry. So it can be concluded that type of management has influence on the achievement in chemistry of higher secondary students. The comparison of scores is graphically presented in figure.4.7

Figure:4.7


Comparison of Achievement in Chemistry scores based on Type of Management
Frequency
60
50
40
30
20
10
0
36-50
66-80
96-110
126-140
156-170
Class Interval
Govt
Aided
Private

The result does not help to identify exactly the pairs of groups which differ significantly. Hence scheffe's multiple comparison is used for further analysis.

Results of scheffe's procedure is given in table.4.16

Table:4.16

RESULTS OF SCHEFFE'S PROCEDURE

Type of Management	**N**	**Pair**	**P(scheffe)**	**Level of Significance**
Government(A)	158	A Vs B	0.847	Not significant
Aided (B)	92	B Vs C	0.136	Not significant
Un aided (C)	150	A Vs C	0.012	Significant at 0.01 level

The result showed that there is no significant difference between government and aided, aided and unaided higher secondary students in their achievement in chemistry. The other pair government and unaided higher secondary students differ significantly in their achievement in chemistry.

4.COMPARISON OF CHEMISTRY ACHIEVEMENT SCORES OF BACKWARD CASTE, MOSTBACKWARD CASTE AND SCHEDULED CASTE HIGHER SECONDARY STUDENTS

The F- value was calculated to find out the influence of community on achievement in chemistry of higher secondary students. The mean, standard deviation and F-value are presented in table.4.17

Table:4.17

MEAN STANDARD DEVIATION AND F- VALUE OF ACHIEVEMENT SCORES IN CHEMISTRY OF BACKWARD CASTE,MOST BACKWARD CASTE AND SCHEDULED CASTE HIGHER SECONDARY STUDENTS

Community	Mean	SD	Source	Sum of squares	df	Mean square	F	p	Level of significance
Backward caste	109.93	25.46	Between GP	2662.5	2	1331.26	2.010	0.135	Not significant
Most backward caste	108.65	28.45	Within GP	262976.5	397	662.41			
Scheduled caste	118.39	23.58	Total	265639.0	399				

The obtained F– value (2.010) is no significant at any level. This result indicates that there is no significant difference between the higher secondary students belonging to various castes in their achievement in chemistry. So it can be concluded that community has no influence on achievement in chemistry of higher secondary students. The comparison of scores is graphically presented in figure.4.8

Figure:4.8

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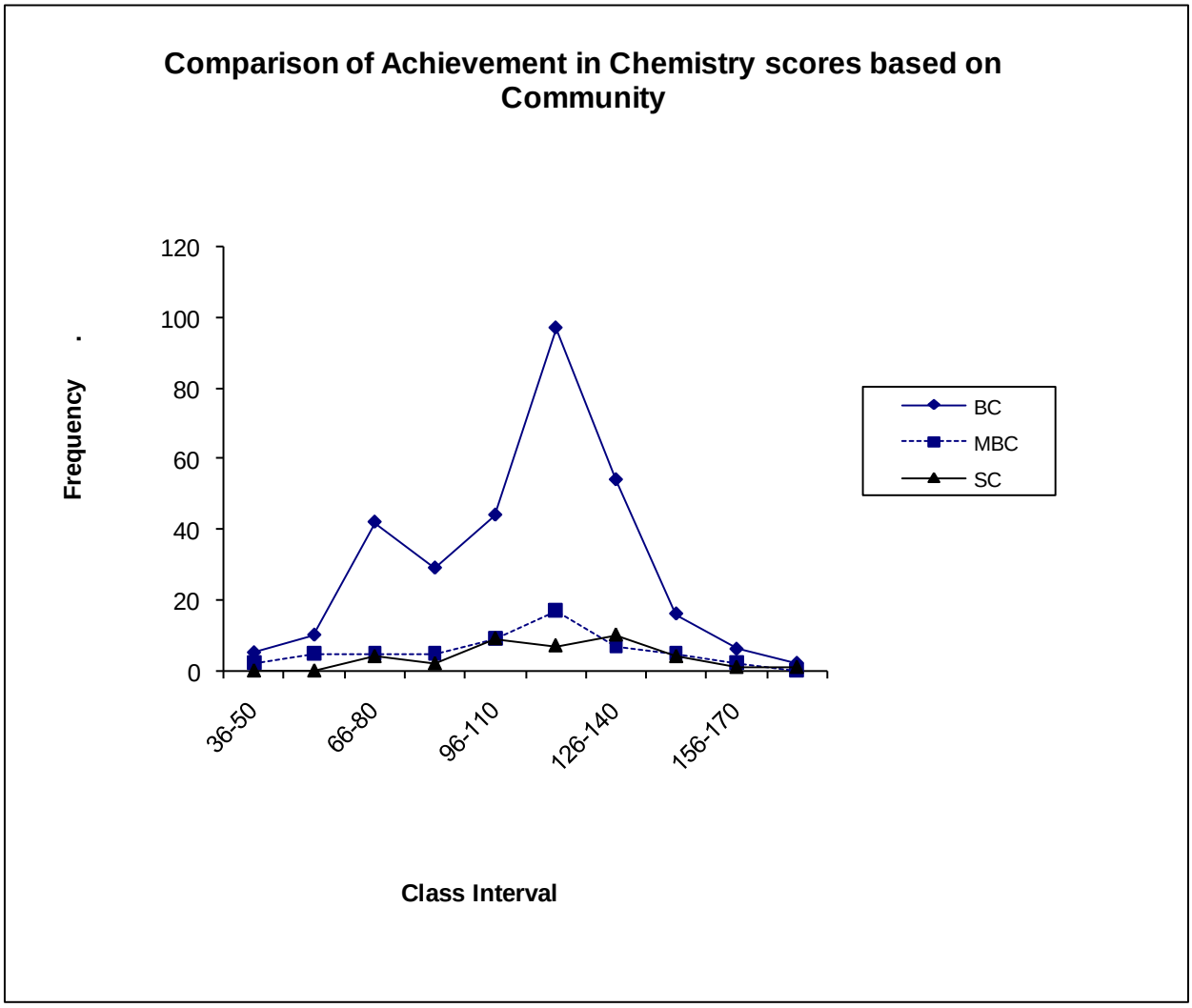
Comparison of Achievement in Chemistry scores based on Community
Frequency
120
100
80
60
40
20
0
36-50
66-80
96-110
126-140
156-170
Class Interval
BC
MBC
SC

PART -III

CORRELATION

The Pearson's product moment co-efficient of correlation is used to find out the extent of relationship between two sets of variables. When the coefficient of correlation 'r' is positive we can say that there is positive relationship between the variables. If the coefficient of correlation 'r' is negative then we say that the relationship between the two variables is negative. If 'r' is zero then there is no relationship between the variables.

INTERPRETATION OF CORRELATION

The co-efficient of correlation 'r' can generally be described as either high or substantial or low or negligible. Garrett (1969) present the following classification for interpreting the value of 'r' is

a).If 'r' is from $\pm$ 0.000 to $\pm$ 0.20 there exists indifferent or negligible correlation.

b).If 'r' is from $\pm$0.20 to $\pm$ 0.40 the correlation is low.

c). If 'r' is from $\pm$0.40 to $\pm$0.70 the correlation is substantial.

If 'r' is from $\pm$ 0.70 to $\pm$ 1 the correlation is very high. This classification of 'r' is broad and can only be accepted general guide with certain reservations.

Table:4.18

COEFFICIENT OF CORRELATION BETWEEN PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY OF TOTAL POPULATION AND CLASSIFIED ON THE BASIS OF GENDER

Category	N	r	Level of significance
Total	400	0.469	Significant at 0.01 level
Male	226	0.412	Significant at 0.01 level
Female	174	0.525	Significant at 0.01 level

As it is shown in the above table the problem solving ability and achievement in chemistry of higher secondary students are positively correlated and significant at 0.01 level. Problem solving ability and achievement in chemistry are positively correlated and significant at 0.01 level for male and female students. The correlation may be described as substantial.

Table :4.19

COEFFICIENT OF CORRELATION BETWEEN PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY OF HIGHER SECONDARY STUDENTS CLASSIFIED ON THE BASIS OF LOCALITY

Locality	**N**	**r**	**Level of significance**
Rural	222	0.484	Significant at 0.01 level
Urban	178	0.450	Significant at 0.01 level

From the table it is clear that for rural and urban students problem solving ability and achievement in chemistry are positively correlated and significant at 0.01 level. The correlation may be described as substantial.

Table:4.20

COEFFICIENT OF CORRELATION BETWEEN PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY OF HIGHER SECONDARY STUDENTS CLASSIFIED ON THE BASIS OF TYPE OF MANAGEMENT

Category	**N**	**r**	**Level of significance**
Government	158	0.382	Significant at 0.01 level
Aided	92	0.498	Significant at 0.01 level
Unaided	150	0.525	Significant at 0.01 level

From the table it is clear that for government, aided and un aided higher secondary students, problem solving ability and achievement in chemistry are positively correlated and significant at 0.01 level. The correlation may be described as 'low' for government school students and 'substantial' for aided and unaided higher secondary school students.

Table :4.21

COEFFICIENT OF CORRELATION BETWEEN PROBLEM SOLVING ABILITY AND ACHIEVEMENT IN CHEMISTRY OF HIGHER SECONDAR STUDENTS CLASSIFIED ON THE BASIS OF COMMUNITY

Category	N	r	Level of significance
Backward caste	305	0.447	Significant at 0.01 level
Most backward caste	57	0.496	Significant at 0.01 level
Scheduled caste	38	0.556	Significant at 0.01 level

From the table it is clear that for the Backward caste, most backward caste and scheduled caste higher secondary students problem solving ability and achievement in chemistry are positively correlated and significant at 0.01 level. The correlation may be described as 'substantial'.

Chapter -V

MAJOR FINDINGS , CONCLUSIONS AND SUGGESTIONS

- **MAJOR PINDINGS OF THE STUDY**
- **CONCLUSIONS**
- **EDUCATIONAL IMPLICATIONS**
- **SUGGESTIONS FOR FURTHER RESEARCH**

In this chapter an attempt is made by the investigator to summarise all the findings and conclusions drawn from the present study.

MAJOR FINDINGS OF THE STUDY

1. The higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 16.16 for a total score of 58 and the standard deviation of 4.55)
2. The male higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 15.60 for a total score of 58 and the standard deviation of 4.21)
3. The female higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 16.90 for a score of 58 and the standard deviation of 4.86)

4. The rural higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 16.3 for a total score of 58 and the standard deviation of 4.54)
5. The urban higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 15.99 for a total score of 58 and the standard deviation of 4.56)
6. The government higher secondary school students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 15.97 for a total score of 58 and the standard deviation of 4.4)
7. The aided higher secondary school students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 15.68 for a total score of 58 and the standard deviation of 4.62)
8. The un aided higher secondary school students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 16.66 for a total score of 58 and the standard deviation of 4.63)
9. The Backward caste higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 16.01 for a total score of 58 and the standard deviation of 4.41)
10. The Most backward caste higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 15.51 for a total score of 58 and the standard deviation of 4.02)

11. The Scheduled caste higher secondary students have low Problem solving ability. This result is supported by the following findings (Arithmetic mean of 18.37 for a total score of 58 and the standard deviation of 5.7)
12. The higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 110.55 for a total score of 200 and the standard deviation of 25.80)
13. The male higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 109.07 for a total score of 200 and the standard deviation of 25.41)
14. The female higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 112.47 for a total score of 200 and the standard deviation of 26.25)
15. The rural higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 112.83 for a total score of 200 and the standard deviation of 25.01)
16. The urban higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 107.71 for a total score of 200 and the standard deviation of 26.55)
17. The government higher secondary school students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 106.84 for a total score of 200 and the standard deviation of 24.86)

18. The aided higher secondary school students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 108.77 for a total score of 200 and the standard deviation of 27.9)
19. The un aided higher secondary school students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 115.55 for a total score of 200 and the standard deviation of 24.79)
20. The Backward caste higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 109.93 for a total score of 200 and the standard deviation of 25.46)
21. The Most backward caste higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 108.65 for a total score of 200 and the standard deviation of 28.45)
22. The Scheduled caste higher secondary students have average Achievement in chemistry. This result is supported by the following findings (Arithmetic mean of 118.39 for a total score of 200 and the standard deviation of 23.58)
23. There is significant difference between the male and female higher secondary students in their Problem solving ability This result is supported by the following findings [t value = 2.809 ; $p > 0.01$]
24. There is no significant difference between the rural and urban higher secondary students in their Problem solving ability This result is supported by the following findings [t value = 0.677 ; $p < 0.01$]

25. There is no significant difference between in the problem solving ability of higher secondary students belonging the various types of management . This result is supported by the following findings [f value = 1.555 ; $p < 0.01$]
26. There is significant difference between the higher secondary students belonging to various communities in their Problem solving ability . This result is supported by the following findings [f value = 5.351 ; $p > 0.01$]
27. There is no significant difference between the male and female higher secondary students in their Achievement in chemistry . This result is supported by the following findings [t value = 1.302 ; $p < 0.01$]
28. There is significant difference between the rural and urban higher secondary students in their Achievement in chemistry . This result is supported by the following findings [t value = 1.965 ; $p > 0.05$]
29. There is significant difference between the higher secondary students belonging to various type of management in their Achievement in chemistry . This result is supported by the following findings [f value = 4.764 ; $p > 0.01$]
30. There is no significant difference between the higher secondary students belonging to various castes in their Achievement in chemistry . This result is supported by the following findings [f value = 2.010 ; $p < 0.01$]
31. Problem solving ability and achievement in chemistry of higher secondary students are positively correlated and significant at 0.01 level ($r = 0.469$)
32. Problem solving ability and achievement in chemistry are positively and significantly correlated with each other at 0.01 level for male students ($r = 0.412$)

33. Problem solving ability and achievement in chemistry are positively and significantly correlated with each other at 0.01 level for female students (r = 0.525)
34. Problem solving ability and achievement in chemistry are positively and significantly correlated with each other at 0.01 level for rural students (r = 0.484)
35. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for urban students (r= 0.450)
36. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for government school students (r= 0.382)
37. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for aided school students (r= 0.498)
38. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for un aided school students (r= 0.525)
39. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for backward caste students (r= 0.447)
40. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for most backward caste students (r= 0.496)

41. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other at 0.01 level for scheduled caste students (r= 0.556)

CONCLUSIONS

The major conclusions drawn from the present study are the following.

1. The higher secondary students have low problem solving ability.
2. Gender and community have influence on the problem solving ability of higher secondary students.
3. Locality and type of management have no influence on the problem solving ability of higher secondary students.
4. The higher secondary students have average achievement in chemistry.
5. Locality and type of management have influence on the achievement in chemistry of higher secondary students.
6. Gender and community have no influence on the achievement in chemistry of higher secondary students.
7. Problem solving ability and achievement in chemistry of higher secondary students are positively and significantly correlated with each other.

EDUCATIONAL IMPLICATIONS

The study revealed that higher secondary students have low problem solving ability. For improving their problem solving ability the following suggestions can be given

1. The curriculum should be designed in such away to provide scope for developing problem solving ability.
2. Examination system should provide opportunities for testing problem solving ability.
3. Students should be encouraged to participate in quiz programmes and competitive examinations.
4. Pupils should be encouraged to solve puzzles.
5. Pupils should be provided with free and necessary environment at home and school for developing problem solving ability.
6. Teacher should encourage divergent thinking in students, so that they learn to tackle the problems in different ways.
7. Students should be given enough drilling on variety of problems.
8. Teacher should motivate the students to find out the solution independently.

From the present study, it is clear that higher secondary students have only average achievement in chemistry. For improving their achievement following suggestions can be given.

1.Well equipped laboratories should be provided in every school.

2. Libraries should be equipped with necessary books on chemistry and they should be encouraged to read them.

3 .The higher secondary students should be made aware of the importance of chemistry.

4. Project work should be given to students based on the content.

5. Teacher should ask more questions in the class.

6 .Seminars , discussions etc should be arranged.

SUGGESTIONS FOR FURTHER RESEARCH

Based on the findings of present investigation the investigator suggests the following areas for further research in the field.

1. The present study is confined only to the students of kanyakumari district. This study can be extended to other districts of Tamil Nadu.
2. Similar studies can be conducted at other levels –primary ,secondary etc.
3. The study can be extended by taking more variables.
4. A study on the relationship between creativity and problem solving ability, intelligence and problem solving ability etc can be made.

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APPENDICES

N.V.K.S.D COLLEGE OF EDUCATION, ATTOOR

KANYA KUMARI DISTRICT

PROBLEM SOLVING ABILITY TEST

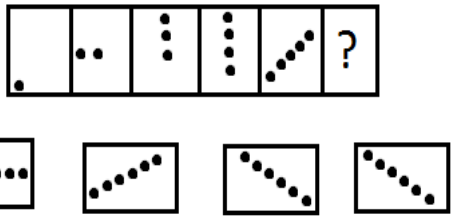
(Prepared by Deepa R.P & Dr.M.Sadanandan)

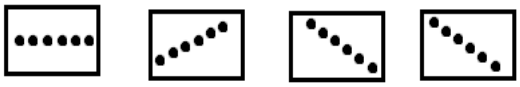
Instructions:

This test is designed for checking the ability in problem solving. The test consists of items related to number series, figural problems, missing parts and word problems. Read the following items carefully, identify the problem and select the correct solution. For each item four alternatives namely a, b, c, d are given write your response in the box given in the right.

I. How the problem figures are given. Find the answer figure from among the given alternatives.

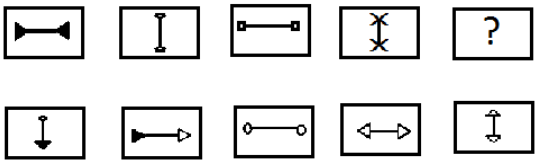
1. Find the missing part of the following.





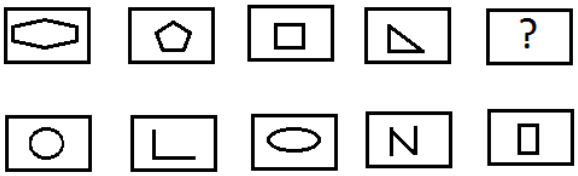
a) b) c) d)

2. Please find the figures continuing the series.



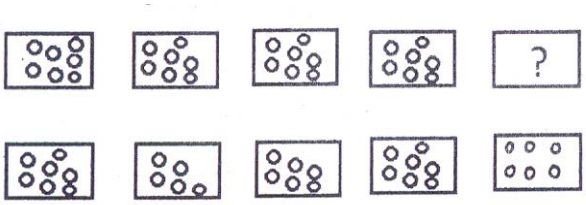
a) b) c) d) e)

3. Please find the figures continuing the series.



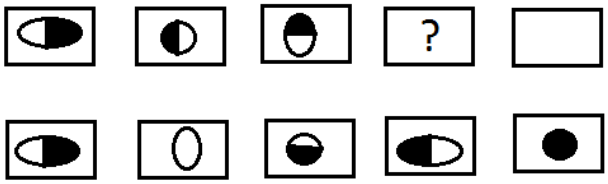
a) b) c) d) e)

4. Please find the figures continuing the series.



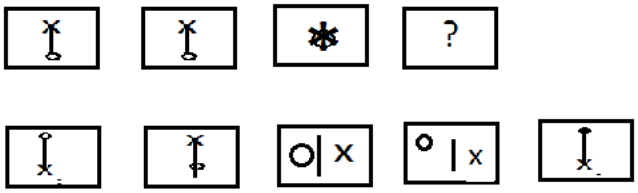
a) b) c) d) e)

5. Please find the figures continuing the series.



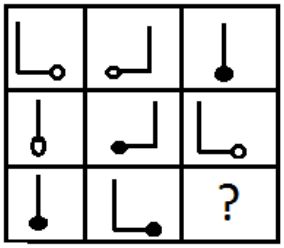
a) b) c) d) e)

6. Please find the figures continuing the series.

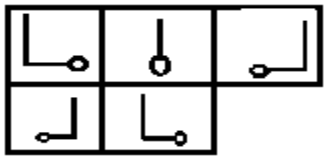


a) b) c) d) e)

7. Please find the figures continuing the series.



a) b) c)

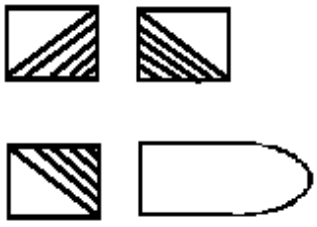


d) e)

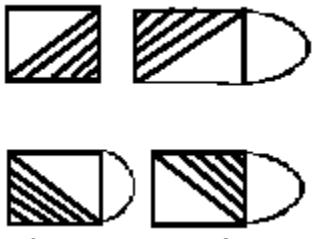
8. Please find the odd.

a) b) c) d) e)

9. Find the missing part of the following

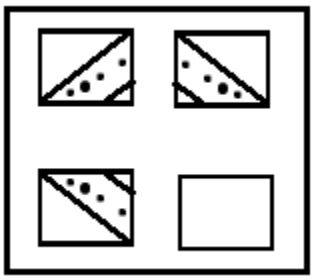


a) b)



c) d)

10. Find the missing part of the following



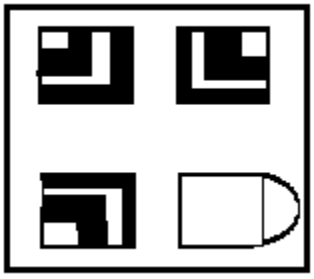
a)

b)

c)

d)

11. Find the missing part of the following



a)

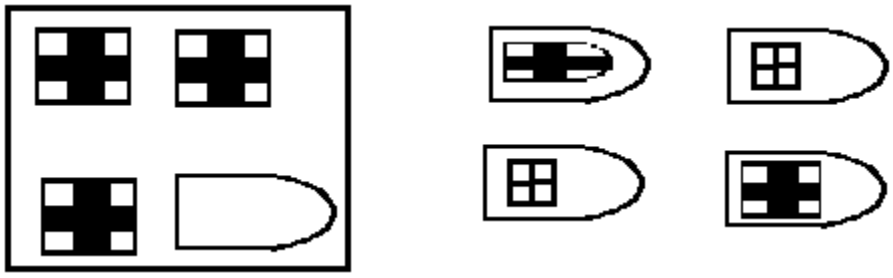
b)

C)

d)

12. Find the missing part of the following

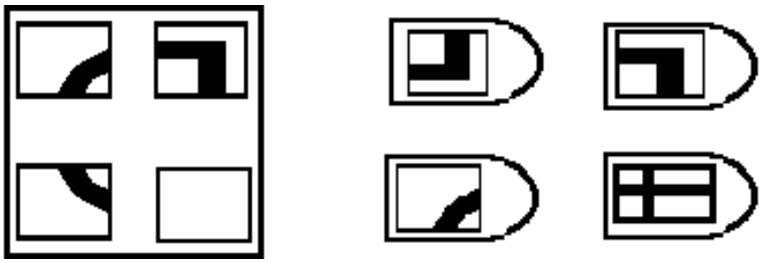
a) b)



c) d)

13. Find the missing part of the following

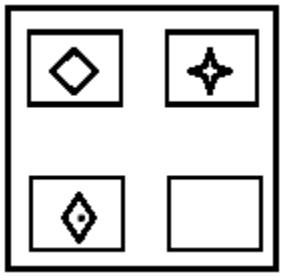
a) b)



c) d)

14. Find the missing part of the following

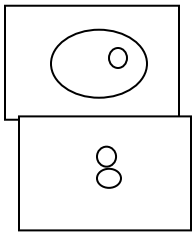
a) b)

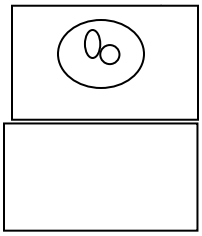


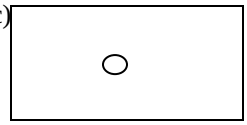
c) d)

15. Please find the odd.

a) b) c)







d) e)

II. In the following items a series of numbers or letters are given. Find the missing character from among the given alternatives

16. Find the missing term 0, 2, 8, 14, ____, 34

a) 24 b) 22 c) 20 d)10

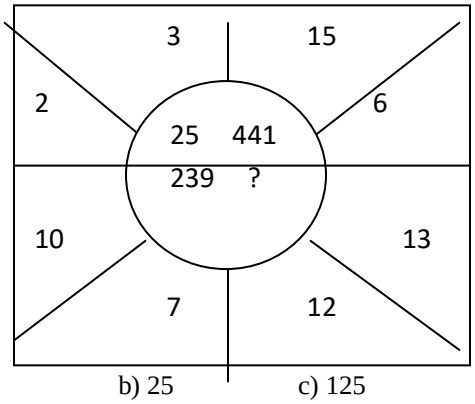
17. Find the wrong term in the number series.1, 3, 7, 15, 27, 63, 127

a) 7 b) 15 c) 27 d) 63

18. Find the next term of the letter series. WVTSQPNM

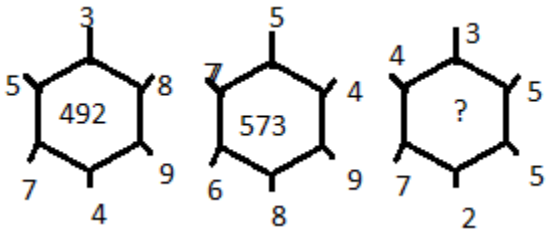
a)IJ b) JI c) JK d) KJ

19. Find the missing character from among the given alternatives.



a) 625 b) 25 c) 125 d) 156

20. Find the missing character from among the given alternatives.



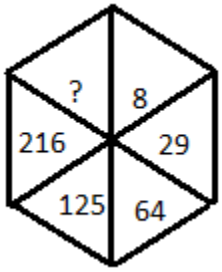
a) 115 b) 130 c) 135 d) 140

21. Fi**nd** the missing character from among the given alternatives.

?	1	2
21	22	40
1	2	5

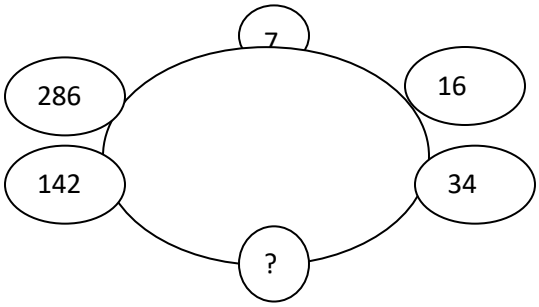
a) 5 b) 4 c) 3 d) 2

22. Find the missing character from among the given alternatives.



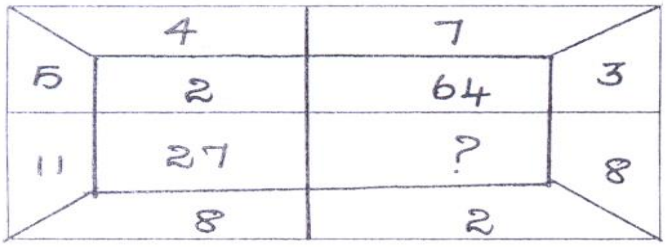
a) 4 b) 305 c) 343 d)729

23. Find the missing character from among the given alternatives.



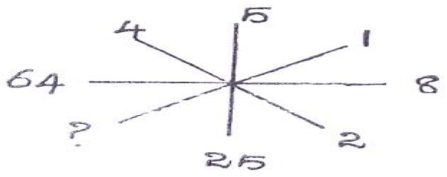
a) 72 b) 70 c) 68 d)66

24. Find the missing character from among the given alternatives.



a) 0 b) 8 c) 125 d)216

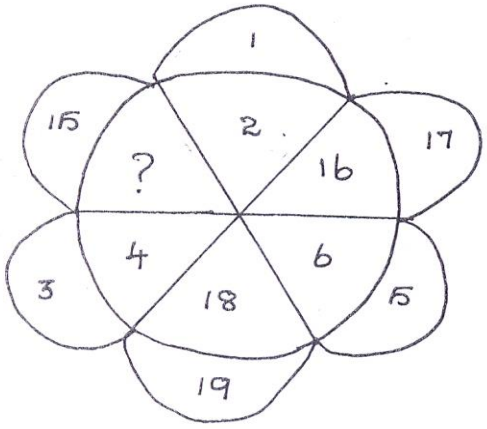
25. Find the missing character from among the given alternatives



.

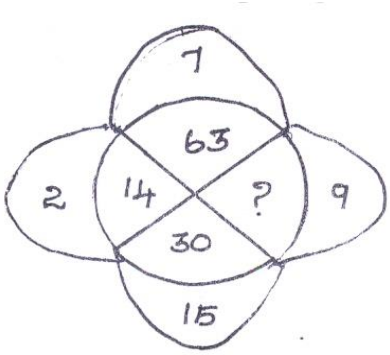
a)1 b) 2 c) 3 d)4

26. Find the missing character from among the given alternatives.



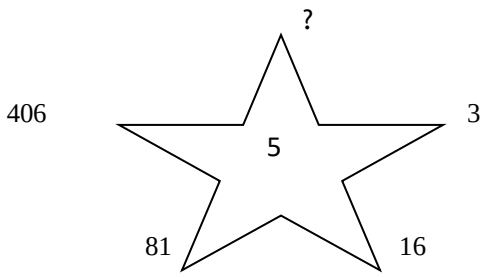
a)13 b) 14 c) 20 d)21

27. Find the missing character from among the given alternatives.



a)33 b) 145 c) 135 d)18

28. Find the missing character from among the given alternatives.



a)1 b) 731 c) 625 d)2031

29. If 53 +31=2, 45+27=1, 69+32=3 , What is 97 +26 = ?

a)1 b) 2 c) 3 d)4

III. Certain problems and solutions are given below. Read the problems carefully and select the correct solutions from the given alternatives

30. 30 years ago to would take a worker few hours to make a chair. Today it takes him just 30 minutes.;
    a) Man has become more industrious
    b) Chairs have s shorter life cycle
    c) workers have more spare time
    d) productivity has increased.

31. Drinking and driving causes many accidents.

a) People drink too much alcohol
b) People should not drive when drunk over the legal limit
c) There is a chance of 20 percent to cause an accident by driving in drunk condition
d) Alcohol dimenses driving skill
e) The police should carry out more breath analyzing tests.

32. Today is Wednesday, what will be the fourth day from yesterday be?

a) Sunday b) Monday

c)Friday d) Thursday e) Saturday

33. Which lamp is the brightest?

Lamp A is less bright than lamp B

a) b)Lamp B is the brighter than lamp C
b) Lamp C is bright as lamp D
c) Lamp D is brighter than lamp A

a) Lamp A b) lamp B c) lamp C d) lamp D e) No solution

34. A trader buys tea for Rs.1200/- and sells it for 1500 per of tea. He makes a profit of Rs.50/- How many of sacks of tea did be have?

a) 6 b) 7 c) 8 d) 4

35. 87 kg of potatoes are distributed in two boxes. One box weighs 11kg less than the other one. How many kilograms of potatoes does the lighter box contain?

a) 38 b)23 c) 42 d)35

36. Aruna ranks in a class or forty-six. What will be her rank form the last.

a) 33 b)34 c) 35 d) 37

37. Starting from a point P. Sachin walked 20 metres towards south. He turned left and walked so meters. He then turned left and walked 20 meters. He again turned left and walked 40 meters and reached a point O. How for and which direction is the point Q from the point P?

a) 20m west b)10m east c)10m west d) 10m north

38. A clock is so place that at 12 noon its minute hand point at 1.30 P.M.

a) North b) south c) East d) West

39. What is the smallest number of ducks that could swim in this formation. Two ducks in front of duck, two ducks behind a duck and a duck between two ducks.

a) 3 b)5 c)7 d) 9

40. In a group of 15 people 7 read French, 8 read English while 3 of them read none of these two. How many of them read French and English both?

a) 0 b 3 c)4 d) 5

41. The mean of five consecutive number is 7. Which is the highest number?

a) 8 b)10 c)7 d) 9

42. If the price of silver is Rs.3810 per 100gms. What will be the approximate value of 15.7gm?

a) 900 b)65 c)600 d) 750s

43. One third of three forth of a number is 30 What is the number?

a) 90 b)12 c)150 d) 80

44. A train running at speed of 90km/hr crosses a platform double its length is 36 second. Find the length of the platform.

a) 450m b)200m c)300m d)600m

45. In the following number series one number is wrong find the number
11, 13, 19, 26, 35, 46, 59.

a) 19 b)46 c)13 d) 26

46. Sixteen men compete a work in twelve days, In how many days will 24 included the average increases by one. What is the age of the teacher?

a) 34 years b)42 years c)36 years d)48 years

47. The average age of 24 boys in 2 class is 11. Why the teacher's age is included the average increases by one. What is the age of teacher?

a) 34years b)42years c)36years d) 48years

48. A boat goes 12km down steam and then comes back in 3 hours. If the speed of the current is 3km/hr, the speed of boat in still water is.

a) 9km/hr b)8km/hr c)6km/hr d) 12km/hr

49. If a man can swim down a steam at kmph and upstream at 2kmph, his speed in still water is.

a) 4kmph b)2kmph c)3kmph d) 12km/hr

50. Walking ¾ th of his usual rate, a man is 2 ½

a) 7½hrs b)3½hrs c)3¼hrs d) 7/8hrs

51. Two pipes A and B would fill a tank in 30to 36 minutes respectively. Both pipes being opened find when the first pipe must be turned off so that the tank may be filled in 18 minutes?

a) after 20 mts b)3after15 mts c)after 13 mts d) after 17mt

52. An electric pump can fill pump can fill a tank in 3 hrs. Because of a leak in the tank, it took 3 ½ hours to fill the tank. The leak can dram out all the water of the tank in

a) 21hrs b)24hrs c)10½hrs d) 12hrs

53. To candles A and B of the same length were lighted at the same time, after 5 minutes the candle a was twice as long as the candle B. After 6 minutes the candle A was three times as long as candle B. How long would candle B take to burn completely?

a) 7½mts b)10mts c)12mts d) 15mts

54. If the population of a town is 64.000 and it grows annually at a rate of 10% what is the increase in the population at the end of 3 years.

a) 21184 b)20814 c)21888 d) 20614

55. The area of a rectangular field is 144 sq.m. It its length is increased by 5m, its area increases by 40sq.m. The length of the field is.

a) 12m b)14.4m c)16m d) 18m

56. Six friends A, B, C,D,E & F are sitting in a closed circle racing the centre. E is left of D, C between A & B, F is between E&A who is left of B?

a) A b)C c)D d) E

57. Anu is taller than Anand but shorter than seema. Krishna is taller than Rohan but shorter than Anand. Dhiraj is taller than Krishna but shorter than seema who among them is the tallest?

a)rohan b)Seema c)Krishna d) Dhiraj

58. There are some horse and hens in a ground. The of heads is 79, and the number of legs is 200. Find the number of horses.

a)21 b)35 c)22 d) 42

Problem solving ability test
Response sheet

Sl.No	A	B	C	D	E
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E
11	A	B	C	D	E
12	A	B	C	D	E
13	A	B	C	D	E
14	A	B	C	D	E
15	A	B	C	D	E
16	A	B	C	D	E
17	A	B	C	D	E
18	A	B	C	D	E
19	A	B	C	D	E
20	A	B	C	D	E
21	A	B	C	D	E
22	A	B	C	D	E
23	A	B	C	D	E
24	A	B	C	D	E
25	A	B	C	D	E
26	A	B	C	D	E
27	A	B	C	D	E

28	A	B	C	D	E
29	A	B	C	D	E
30	A	B	C	D	E
31	A	B	C	D	E
32	A	B	C	D	E
33	A	B	C	D	E
34	A	B	C	D	E
35	A	B	C	D	E
36	A	B	C	D	E
37	A	B	C	D	E
38	A	B	C	D	E
39	A	B	C	D	E
40	A	B	C	D	E
41	A	B	C	D	E
42	A	B	C	D	E
43	A	B	C	D	E
44	A	B	C	D	E
45	A	B	C	D	E
46	A	B	C	D	E
47	A	B	C	D	E
48	A	B	C	D	E
49	A	B	C	D	E
50	A	B	C	D	E
51	A	B	C	D	E
52	A	B	C	D	E
53	A	B	C	D	E
54	A	B	C	D	E
55	A	B	C	D	E
56	A	B	C	D	E
57	A	B	C	D	E
58	A	B	C	D	E

SCORING KEY : PROBLEM SOLVING ABILITY TEST

1)C 2)D 3)D 4)A 5)C 6)E 7)C 8)C 9)B 10)C 11)D

12)D 13)B 14)D 15)E 16)A 17)C 18)D 19)A 20)B 21)D 22)C

23)B 24)B 25)A 26)B 27)C 28)D 29)B 30)D 31)D 32)E 33)B

34)A 35)A 36)C 37)C 38)C 39)A 40)B 41)D 42)C 43)B 44)D

45)C 46)C 47)C 48)A 49)A 50)A 51)B 52)A 53)A 54)A 55)C

56)C 57)B 58)A

N.V.K.S.D COLLEGE OF EDUCATION, ATTOOR

KANYA KUMARI DISTRICT

GENERAL DATA SHEET

1.	Name	:	
2.	Class	:	
3.	Gender	:	Male/ Female
4.	Locality of the Institution	:	Rural / Urban
5.	Type of Management	:	Govt / Aided / self-finance
6.	Religion	:	Hindu / Christian / Muslim
7.	Community	:	BC / MBC / SC