CHAPTER III

METHOD AND PROCEDURE

3.1 Method

In the present study descriptive survey method has been used. The term survey suggests gathering of related evidence to current conditions. Survey research is a method of collecting and analysing data from large number of respondents representing a specific population (Dallen, 1971).

3.2 Sample

The sample of the study was selected by random sampling procedure. In other words, this sample is representative of the whole population. In this study students of both the sexes from different geographical locales have been selected randomly. Random selection is a process by which every element in the population has an equal chance of being chosen in the sample and the same was adopted for the present study.

The sample comprises Hindu and Muslim students studying in 9th and 10th classes. The total sample includes 1000 students and its distribution is as follow:
TABLE 3.1
SAMPLE DISTRIBUTION (N = 1000)

<table>
<thead>
<tr>
<th>Religion</th>
<th>Geographical Locale</th>
<th>Class</th>
<th>Sex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindu</td>
<td>Muslim</td>
<td>Urban</td>
<td>Rural</td>
</tr>
<tr>
<td>600</td>
<td>400</td>
<td>800</td>
<td>200</td>
</tr>
</tbody>
</table>

Salient Features of the Sample:

The investigator has selected sample in accordance to the need of the study. This study is meant to determine the levels of understanding of science and scientific temper among the students. This sample has following characteristics:

1. Students from two different religious background, namely Hindu and Muslim have been selected.
2. Students from different academic background have been selected.
3. One group of students (class IX students) have studied science for nine years in school, which is a sufficient period to inculcate scientific temper.
4. This sample comprises both male and female to determine sex bias, if there is any, due to formal education.

3.3 Research Design

There were five independent variables, each has two levels. Therefore, the research design for this study has been factorial design. The five independent variables has been as follows:
1. Type of Religion : Hindu and Muslim
2. Class level : 9th and 10th
3. Type of School : Government Schools and Private Schools
4. Geographical locale : Urban and Rural
5. Sex : Male and Female

The dependent variables of the present investigation has been:
1. Understanding of Science and its Dimensions
2. Scientific Temper and its Dimensions

Procedure for Analysis:

Data has been computerised and following calculations were made:

1. Mean and Standard Deviation
2. Critical Ratio test for significant difference between means
3. Coefficient of correlation

With the help of above statistical treatments, inter group comparison and relationships have been tested.

3.4 Variables and their Measurement

The study involved measurement of two variables the Understanding of Science and Scientific Temper. The independent variable religion was taken in the form of intact religious groups of Hindu and Muslim students. The two dependent variables were measured by Understanding of Science Scale and Scientific Temper Scale, developed
by Leela Pradhan (Kansakar) 1996. The details of these two scales are presented.

3.4.1 Understanding of Science Scale

The understanding of science and technology related issues are essential for thoughtful decision as well as for personal well being of all citizens. The understanding of science is a concept which reflect the adequate comprehension of basic scientific concepts.

The survey of the related literature has revealed that researchers have attempted some of the significant studies related to the nature of science. Such studies have been conducted in the U. S. A., Australia and India. But little research effort has been made on the understanding of science.

Understanding of science, as a field has recently gained popularity and attempts have been made in Britain to determine the level of understanding of science, taking one or two specific elements of science at a time. In India, limited attempts has been made.

Understanding of Science: A Theoretical Framework:

Significant social changes have occurred since world war II. During the post world war period there has been significant interaction of science, technology and society and formal education is introducing students to the ways and means of democratic participation in the context of science technology social related issues. Therefore, the public perception of science has changed dramatically. Consequently people
are aware of many diverse issues such as environmental awareness, development of nuclear bomb, antibiotics, harmful effects of insecticides and cleaning atmosphere from radiation fall out.

Most thinking people would agree that there is a need of understanding of science so that people can play positive role in building bridges between science and society. But it appears that we have to go a long way to achieve such objectives. Bhopal Gas Leak Tragedy in 1984 has clearly indicated that understanding of science would have saved many lives from such industrial disasters. In 1990 a national newspaper in Britain ran a poll which revealed that over 80 percent of people questioned disapproval of genetic engineering but fewer than 10 percent new what it was. Therefore, it is imperative that public should have adequate understanding of science related social issues. Hodson and Reid (1988) has very aptly mentioned:

If we genuinely seek an informed and thinking citizenry capable of considering scientific and technological matters in the context of economic constraints, environmental issues, ethical concerns and social and aesthetic considerations we must include in our science curriculum a consideration of the impact of science and technology on society and the influence of society on science, scientific research and scientific development.

The investigator feels that the understanding of science should comprise a composite picture of different dimensions of science and society which will serve as a vehicle for the development of personal and social skills for making reasonable decisions on such issues. Therefore, three dimensions of this scale have been finalised which are as follows:
I) Concepts of Science
II) Science Policy Perspectives
III) Science Value Perspectives

A brief description of these three dimensions has been presented.

I- Concepts of Science:

Science has an ever increasing fund of scientific knowledge comprising facts, principles and generalizations of science. This vast scientific knowledge is to be presented through such terms which convey an appropriate meaning. These terms are known as concepts, major ideas or major points. Technically, 'a concept is an abstraction of a class of events, objects or other phenomena having common attributes.' Similarly, Tarrooll (1964) defines, "a concept is an abstraction of a series of experiences that defines a class of objects or events."

The investigator has assumed that understanding of science comprises learning of scientific information which will give scientific awareness about major ideas of science. Some of the items, selected in this instrument, which represent this dimension, are as follows:

2. Use of solar energy can solve fuel problems.
9. Nutritional food is essential for healthy living.
10. Use of tobacco is injurious to health.
11. Software is a term used in computers.
12. Genetic engineering Research should not be promoted.
13. Computer virus is a dreaded disease.
16. Depletion of ozone layer will not create any environmental disaster.

II- Science Policy Perspective:

Science and technology have made enormous progress. They have produced many marvels and conveniences during this period of time. Science and technology have also many socially undesirable aspects. In both the cases, there is a need to take policy decisions. These decisions will balance the benefits and problems given by science and technology. How these policy decisions influence growth of science and technology is evident from programmes related to the use of manure in fields, computer in research and peaceful uses of atomic energy. Policy decisions related to satellite communications, nuclear fusion, biomedical applications, recombinant DNA the use of pesticides and insecticides, drug use and abuse, pollution and population growth are such problems which need attention.

This dimension has included items, such as:

21. Population growth must be curbed to avoid depletion of scarce resources.

23. Mass media has no effect in educating masses on population issues.


25. Destruction of forests does not increase imbalances between man and environment.
III- Science Value Perspective:

It is true that concepts of science and policy decisions on science are of immense utility for all of us. But science as an integral part of culture and its accultarization role has most significant meaning in the whole process. Science should develop personal and social values to reflect aesthetic, humanistic and practical values.

Values of science necessitates for independence of thought, use of rationality, acceptance of failure and unsatiable desire to search new knowledge and ideas. In this instrument, simple values such as questioning attitude, cause and effect relationship have been included. Some of the items included in this instrument are as follows:

37. Suspended judgement has no relevance in scientific findings.
38. There is no need to challenge authority.
40. There is no use in seeking cause and effect relationship explanation.

Instrument's Validity

The most important consideration in judging the adequacy of a test is its validity. Instrument reliability is necessary, but not a sufficient condition for instrument validity. Being reliable is part of being valid or to measure something consistently is to be measuring something. An instrument is valid if it measures what it is being used to measure. Thus, there are potentially as many types of validity as there are measurement purposes to which an instrument can be applied (Munnally, 1967).
Two major classes of instrument validity are identified.

1. Content validity
2. Construct validity

Content validity is concerned with the representativeness of an instrument's subject matter. It is a matter of judgement. Each item in an instrument must be studied and its relevance to the measuring goals are to be evaluated. This procedure is most efficiently accomplished during instrument development. (Cronbach 1970, Kerlinger 1973, Munnally 1967). It is not possible to draw all items for the factors being assessed so a random sample of items from the content was selected. The content validity of understanding science scale was judged during instrument development. The instrument is based on definitions of understanding science. In addition to this the content validity of each item was also calculated by Lawshe (1975) method and the item having CVR below 0.62 were rejected.

Construct validity concerns the extent, to which a test tells us something about a meaningful characteristic of the individual. Testing the construct validity of an instrument is testing the theory behind the instrument. The instrument is ability to differentiate between the two groups can be evidence of its construct validity. An instrument can be relevant to establishing its construct validity if the test items are expected to inter correlates i.e. finding (substantial) correlations between the test scores to the total scores. The instrument would then have predictive power in those situations which are defined by its items (Cronbach and
Meehl 1966). The same procedure was adopted to calculate the construct validity of the instrument.

Inter correlations between the three dimensions of understanding of Science and correlations of these dimensions to the total score of the different groups of samples were calculated. These correlations are shown in table 3.2.

**Instrument's Reliability**

Reliability is defined as the consistency with which a test measures what ever it measures. It is the ability of instrument to yield consistent results from one set of measures to another. It is the extent to which the obtained test scores are free from random error. Munnally (1967) has outlined major sources of error which can threaten instrument reliability. The major sources of random error within an instrument include item sampling, item ambiguity, subjective scoring and respondent guessing. Many of these errors may be overcome during the construction of the instrument. Whenever we give a test there are many factors which enter into the error component of an individual score. Some of these are guessing, misleading an item, daily fluctuations in an individuals health, emotional status and many physical factors. The size of this error component is related to the reliability of any measuring device. The smaller than error component on error score, the more reliable the instrument. In its simplest form reliability means consistency. A reliable instrument leads to measurement units which also fairly similar from time to time.
There are a number of techniques used in the computation of reliability co-efficients. Each technique assesses the influence of one or more of the major sources of the random error which can effect an instrument. Coefficient alpha is the basic formula for determining instrument reliability as it is effected by the instrument's internal consistency. Munnally (1967) suggests that it be the first reliability estimate calculated for every instrument. The split-half-method is another method of testing instrument's reliability which measures instrument's internal consistency. The split-half-method assess sources of random error within an instrument by correlating results on two halves of an instrument. The split half correlations can be made for any one instrument as there exist ways of dividing the instrument in half (Anasbasi 1961 and Munnally 1967). Instrument reliabilities of at least 0.75 are wanted. For the purpose of applied research where important decisions are made with respect to specific test scores, a reliability of 0.90 or higher is desirable for instrumentation. (Anasbasi 1961, Munnally 1967, Kerlinger 1970).

The calculation of coefficient alpha yields internal consistency coefficient. The reliability of instrument understanding of science scale was also computed by statistics called standard error of measurement. This statistic is not affected by the range of scores of the sample tested. This standard error of measurement is the standard deviation of a sample of scores of an individual about his true score. For the present calculation of standard error of measurement Lord (1959) formula was used. The
reliability as computed by this method was found to be 0.842 of understanding science scale.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Reliability Coefficient</th>
<th>Total score</th>
<th>Science Policy</th>
<th>Value Judgement</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Science Concept</td>
<td>0.703</td>
<td>0.759</td>
<td>0.243</td>
<td>0.259</td>
</tr>
<tr>
<td>ii. Science Policy</td>
<td>0.678</td>
<td>0.715</td>
<td></td>
<td>0.306</td>
</tr>
<tr>
<td>iii. Value Judgement</td>
<td>0.582</td>
<td>0.616</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the table 3.2 it is evident that reliability coefficient for dimension Science concept is 0.703, and for dimension Science Policy is 0.678 and for value judgement dimension 0.582. The table further reveals the coefficient of correlation with total scores and dimensions of the scale. All the calculated coefficients of each dimensions with the total score are high and positive. The correlation coefficients between dimensions are low. The high coefficients of correlation with total scores and weak correlation with in the dimensions justify the inclusion of these dimensions in the scale, leading to high construct validity of understanding of science scale.

**Final form of Understanding of Science Scale**

The final form of understanding of science scale consists of 40
items measuring understanding of different dimension of science. The following table 3.3 shows the number of items and their polarity in each dimension of understanding of science.

<table>
<thead>
<tr>
<th>TABLE 3.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISTRIBUTIONS OF ITEMS IN EACH DIMENSION AND THEIR POLARITY</td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
<tr>
<td>i. Concept of science</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>ii. Science Policy</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>iii. Value Judgement</td>
</tr>
</tbody>
</table>

3.4.2 Scientific Temper Scale

It is not easy to define science because it defines its own definition. James B. Conant has defined science as an interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful of further experimentation and observations (Conant, 1951). Later on thinkers related science with inquiry and social aspects of society. Science has been taken as a human activity with a concern for scientific knowledge (certain facts, principles and theories worth knowing), a concern for the processes and methods of science reasoning and investigating direct
experience of scientific activity appreciation of the complex relationship between science and society and fostering positive attitudes towards science (Hodson, 1985). Scientific thinking stemmed from curiosity about natural phenomena, humility and skepticism, objectivity and scientific inquiry and processes.

Scientific thinking has given new direction for developing objective and independent thinking among the people. It has been also known as scientific attitude which reflects humility, objectivity, curiosity, avoidance of dogmatism, willingness to consider new data, and the positive approach to failure. These tenets of scientific attitude influence the thinking of people. John Dewey in 1934 observed that every course in every subject should have as its chief end the cultivation of these attitudes of mind, open mindedness, intellectual integrity, observation and testing their opinion and beliefs that are characteristics of scientific attitude. The first attempt by was Davis (1935) Ebel (1938) further tried to define scientific attitude and also determined its components. Scientific attitude and its inculcation became objectives of education in general and specific in science education.

**The Nature of Scientific Temper:**

Since the acceptance of philosophical and sociological perspectives of science, scientific attitude gained significance. But a wider perspective was given to this term as 'scientific temper' when understanding of science and scientific thinking became our integral part of formal as well as non-formal system of education. These two
terms scientific attitude and scientific temper differ in their generality and the difference is very subtle.

National Policy on Education - 1986 has mentioned that, "Education has a acculturating role. It refines sensivities and perceptions that contribute to national cohesion, a scientific temper and independence of mind and spirit - thus furthering the goals of socialism, secularism and democracy enshrined in our constitution."

Scientific temper has pervasive implications as related to objectivity, rationality and as a way of thinking and acting. Scientific temper is a part of a thinking human being who tries to use his mental abilities to decision making in every day life activities. For the purposes of this study we can say that, scientific temper is a unified state of mind comprising thoughts, action and conduct of an individual in a specific situation. Scientific temper is a process of thinking to act objectively, rationally based upon available evidences at the time of making decisions.

**Measuring Scientific Temper:**

It is not easy to measure scientific temper as it reflects the cognitive and affective modes of thinking. But it can be observed and measured while we observe the reaction, behaviour of the person as related to some incidence or situation.

In educational perspective, scientific temper is to be measured so that teaching and learning can be equipped better to inculcate this state of mind or this pattern of thinking.
Though there are a good number of tools to measure scientific attitude, the area of scientific temper still needs exploration and testing for the development of a reliable tool.

**Scientific Temper: A Theoretical Framework:**

A sensible and balanced view of science education is dependent on the development of much awareness about values of science and scientific thinking and their role in society.

The scientific approach and temper are or should be a way of life, a process of thinking, a method of acting and associating with our fellowmen. The scientific temper point out the way along which man should travel. It is the temper of a freeman.

Scientific temper is cognitive and affective aspect of the personality of a person. Scientific temper is a value based process to look at things and events. It is similar to scientific thinking. Scientific temper is a unified state of mind, comprising thoughts, action and conduct of an individual in a specific situation. Scientific temper is a process of thinking to act objectively, rationally based on available evidences at the time of making decisions.

There are four dimensions that reflect the views and beliefs on scientific temper. These are as follows:

I) Value perspective
II) Aversion to superstitions
III) A set of attitudes
IV) A world view perspective.

A brief description of these four dimensions has been presented.

I- Value Perspective:

Science provides a powerful way of investigating and understanding the world. It is related to the problems of everyday living and stress practical skills, decision making and problem solving. The values of science as a way of investigating and solving problems as well as enhancing decision making among individuals have long been recognised. Value systems and ethics are not peripheral to science and technology but constitute their very basis and driving force. Hence the shift to balanced socio-economic system will require a corresponding shift of values from self assertion and competition to co-operation and social justice, from expansion to conservation and from material acquisition to inner growth (Capra, 1982). These values provide energy leading to liberating and enriching experiences. Science and technology have a significant capacity to shape nearly every aspect of human experience including social structure and personal and cultural values.

This value perspective will help in solving science based personal and social problems. A set of values as related to science and scientists have been objectivity, rationality, inquiring mind, intelligent decision making, insatiable curiosity, ingenuity, perseverance and internal drive to find out the unknown.

The investigator has taken scientific temper as a unified state
of mind, comprising thoughts, action and conduct of an individual in a specific situation. It is possible if we look at things with objective and rational attitude.

In this socially polluted environment, the value perspective dimension of scientific temper should be observable in the behaviour of the people, then only we can strive for a just and honest society. Some of the items in this dimension are as follows:

2. I take interest in the investigation of new ideas.
4. My decisions are influenced by the opinion of others.
6. I believe in intelligent decisions based upon findings.
9. Beliefs given by parents should be accepted.

II- Aversion to Superstitions:

A conventional society generally suffers from age old beliefs and superstition. Illiteracy and ignorance further strengthen these beliefs and faith in supernatural powers. Such faith in supernatural powers increases dependency on luck and give mental resistance to new ideas. Sometimes happening such as earth quake or diseases like plague are taken as displeasure of some deity.

India has traditional societies, though approximately sixty five percent of the population are literate, have accepted scientific thinking as a way of action and thought. Yet age old beliefs continue which are reflected in the behaviour of the people from time to time. How far science education has erased such beliefs is a question to be tested?
A person with scientific temper shall not subscribe to superstition or old beliefs. A person with objective analysis will determine the worth of any unnatural event through analysis based upon evidence. The investigator has taken some items to determine this aspect of scientific temper.

11. Failure in examination is due to bad luck.
20. I consult astrologers to predict weather.
22. Falling of asteroids in sky is a sign of bad luck.

III- A Set of Attitudes:

A person with scientific temper reflects a set of attitudes towards environment, cultural context, science, scientists, use of technology and world view. These attitudes are observable in the behaviour of the person. These attitudes reflect opinion about the use of science and role of science in society.

In India farmers have accepted the use of science and technology to increase their farm yield and achieved the maximum growth. But how far these people reflect faith in scientific research for such purposes is a question to be tested. The investigator has taken these items as a part of scientific temper scale.

23. Use of science and technology have polluted biological environment.
25. Accepting the use of scientific ideas have resulted green revolution in India.
IV- A World View Perspective:

The Industrial Revolution was based upon the use of fossil fuels to run machines, very importantly, these very fossil fuels were also basic to the industrialization of society. Along with the perception of unlimited resources there was apparently unlimited environment for waste disposal. With these perceptions, and the advances and technology the economy prospered. But now we realize that resources and environment are finite. Currently two problems, resource depletion and environmental degradation are very closely related to science and technology. However, it is worth directing our attention to these problems, their solution and renewed efforts to rehabilitate environment and minimise the use of resources. Capra (1982) has observed that division between mind and matter led to a view of the universe as a mechanical system consisting of separate objects which in turn were reduced to fundamental building blocks where properties and interactions were thought to completely determine all natural phenomena. This Cartessian view of nature was further extended to living organisms which were regarded as machines constructed from separate parts.

This whole process is inter related and inter dependent. Too much of fragmentation has created problems of personal health, degradation of social values and destruction of the environment. It needs a new perspective, which is holistic and organic in nature. Because there is an interplay into individuals and their natural and social environment, the balancing of this depends on a holistic view and it needs ecological
awareness and makes it obvious that we have to conserve our physical resources and develop our human resources (Capra, 1982). With this context it is apparent that people need an understanding of the 'dynamic world view' which is rapidly changing from mechanistic to holistic one. People should understand, internalize and practice this world view perspective which is a powerful dimension of scientific thinking. Examples of the items, in this dimension, are as follows:

27. Contributions of science and medicine have reduced child birth rate.

29. Science cannot give clean and healthy global environment.

Validity of Scientific Temper Scale

The most important consideration in judging the adequacy of a test is its validity. Instrument reliability is necessary, but not a sufficient condition for instrument validity. Being reliable is a part of being valid or to measure something consistently is to be measuring something. An instrument is valid if it measures what it is being used to measure. Thus, there are potentially as many types of validity as there are measurement purposes to which and instrument can be applied (Munnally, 1967).

Two major classes of instrument validity are identified.

1. Content validity

2. Construct validity

Content validity is concerned with the representativeness of
an instruments' subject matter. It is a matter of judgement. Such item in an instrument must be studied and its relevance to the measuring goals are to be evaluated. This procedure is most efficiently accomplished during instrument development. (Cronbach 1970, Kerlinger 1973, Munnally 1967). It is not possible to draw all items for the factors being assessed so a random sample of items from the content was selected. The content validity of scientific temper scale was judged during instrument development. The instrument is based on definitions of scientific temper. In addition to this the content validity of each item was also calculated by Lawshe (1975) method and the item having CVR below 0.62 were rejected.

Construct validity concerns the extent, to which a test tells us something about a meaningful characteristics of the individual. Testing the construct validity of an instrument is testing the theory behind the instrument. The instrument's ability to differentiate between the two groups can be evidenced of its construct validity. An instrument can be relevant to establishing its construct validity if the test items are expected to inter correlates i. e. finding (substantial) correlations between the test scores to the total scores. The instrument would than have predictive power in those situations which are defined by its items (Cronbach and Meehl 1966). The same procedure was adopted to calculate the construct validity of the instrument.

Inter correlations between the four dimensions of scientific Temper and correlations of these dimensions to the total score of the
different groups of samples were calculated. These correlations are shown in table 3.4.

**TABLE 3.4**

COEFFICIENT OF CORRELATION BETWEEN SCORES ON DIMENSIONS AND TOTAL SCORES ON SCIENTIFIC TEMPER SCALE (N=120)

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Total Score</th>
<th>Aversion to superstition II</th>
<th>A set of Attitude III</th>
<th>A world view Perspective IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Value Perspective</td>
<td>0.941</td>
<td>0.146</td>
<td>0.140</td>
<td>0.282</td>
</tr>
<tr>
<td>II. Aversion to superstitions</td>
<td>0.649</td>
<td></td>
<td>0.392</td>
<td>0.262</td>
</tr>
<tr>
<td>III. A set of Attitude</td>
<td>0.481</td>
<td></td>
<td></td>
<td>0.079</td>
</tr>
<tr>
<td>IV. A world view Perspective</td>
<td>0.563</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

From the above it is evident that all the four dimensions of scientific temper scale are highly and positively correlated with the total scores of scale in the group of students. These high correlation between each dimension to the total score justified the inclusion of respective dimension in the scale. The table reflects the coefficient of correlation between each dimensions. All the calculated inter correlation coefficient are positive and weak. Hence each dimension has independent existence in the scientific temper scale, yielding high construct validity of the scale.
### TABLE 3.5

RELIABILITY COEFFICIENTS OF DIMENSIONS OF SCIENTIFIC TEMPER SCALE

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Reliability Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total scale</td>
<td>0.838</td>
</tr>
<tr>
<td>I- Value perspective</td>
<td>0.758</td>
</tr>
<tr>
<td>II- Aversion to superstition</td>
<td>0.818</td>
</tr>
<tr>
<td>III- A set Attitude</td>
<td>0.562</td>
</tr>
<tr>
<td>IV- A world view perspective</td>
<td>0.544</td>
</tr>
</tbody>
</table>

The above table has revealed that the reliability coefficient of scientific temper scale found to be 0.838. The reliability coefficient of value perspective dimension is 0.758 and aversion to superstitions dimensions is 0.818. The coefficient of reliability for dimension attitude towards science is 0.562 and world view perspective dimension is 0.544. Thus, the reliability coefficient of total scale and dimensions of scientific temper are high yielding high reliability of the scale.

**Final Form of Scientific Temper Scale:**

The final form of scientific temper scale consisted of 30 items, measuring sample's Scientific Temper on four dimensions. The following table 3.6 shows the distribution of items and their polarity on different dimensions of scientific temper scale.
TABLE 3.6
DISTRIBUTION OF ITEMS IN EACH DIMENSION AND THEIR POLARITY

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>No. of Items</th>
<th>Positive Polarity Items No.</th>
<th>Negative Polarity Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Value Perspective</td>
<td>16</td>
<td>1,2,3,5,6,8,10</td>
<td>4,7,9,14,16</td>
</tr>
<tr>
<td></td>
<td></td>
<td>12,13,15,17</td>
<td></td>
</tr>
<tr>
<td>II. Aversion the Superstitions</td>
<td>06</td>
<td></td>
<td>11,18,19,20,21,22</td>
</tr>
<tr>
<td>III. A set of Attitudes</td>
<td>04</td>
<td>24,25</td>
<td>23,26</td>
</tr>
<tr>
<td>IV. World View Perspective</td>
<td>04</td>
<td>27,28</td>
<td>29,30</td>
</tr>
</tbody>
</table>

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