CHAPTER II
CHAPTER – II

CONCEPTUAL UNDERSTANDING AND
THEORETICAL VIEWPOINTS ABOUT
PREDICTORS

Present chapter deals with the conceptual understanding of the various variables considered in the present investigation in order to understand the rationale of the relationship of these variables with the mathematical creativity of the students. Also theoretical viewpoints of the different variables under consideration are put forward here to have the better understanding of the predictors taken in the present investigation.

2.1 INTELLIGENCE:

Intelligence – the Dictionary of Education (Good, 1973) says – “the capacity to acquire and apply knowledge”. A number of definitions have been evolved by
psychologists according to their own concept of term ‘intelligence’. All the definitions of intelligence have been systematized by Vernon (1950) and Freeman (1962). Vernon (1950) classified all the definitions under three broad categories such as biological, psychological and operational. Freeman (1962), though classified all definitions of intelligence into three categories, but his approach differs from Vernon.

VERNON’S (1950) CLASSIFICATION:

1) Biological Approach:

This category of definition emphasizes the adaptive nature of human beings. Man is one kind of organism among a million on earth. If we interpret psychology as a biological science, then there is little doubt that we must also interpret intelligence as adaptation to environment. Any other view of intelligence is superficial. This is the most far reaching and general view of intelligence.

According to Vernon (1950), this idea of intelligence is the most fundamental of all. Intelligence, according to this approach, is the capacity to adapt relatively in
new situations of life. But if this biological concept of intelligence is critically examined it is found that many great men to whom one could hardly deny an assessment of exceptional intelligence (e.g. Pascal, Kafka and numerous other academic experts) have been ill-adapted in their social and physical environment. Also the biological concept of intelligence is not of great use from practical point of view in the study of individual difference within a culture.

2) Psychological Approach:

According to this approach, some definitions advanced by experts contained a clear commitment about the relative effects of heredity and environmental influence in the development of intelligence. Burt (1937), an English psychologist, defined ‘intelligence’ as innate general cognitive ability. Since scores on existing intelligence have often been shown to be susceptible to environmental influences, a consequence of this definition is that intelligence as defined differs from intelligence as measured by tests. Psychologists have attempted to escape from this dilemma in two ways. Hebb (1949) and Cattell (1971) have distinguished two kinds of intelligence – calling them intelligence ‘A’ and
intelligence ‘B’ or fluid and crystallized intelligence. The distinctions made by Hebb and Cattell are more or less the same. In each case fluid intelligence or ‘A’ is thought as genetic potentiality, or the basic innate qualities of the individuals’ nervous system and the crystallized intelligence or ‘B’ is mainly the result of experience, learning and environmental factors. Psychologists have specified two types of intelligence, which will in normal circumstances, overlap as much as to be in practice indistinguishable. Further, it is impossible to assess genetic potential uncontaminated by the effects of training and experience and other environmental influences.

The second type of escape from the dilemma is to adopt an operational definition of intelligence.

3) Operational Approach:

The third category of definition is operational. Operational definitions are important to understand the concept of intelligence in clear and definite terms. Scientific terms are defined not in isolation, as in dictionary but by stating the observable conditions under
which a sentence containing the terms is true or false. Instead of defining the word by itself, it is defined by giving the conditions for the truth of a sentence in which the term occurs. Such definitions are called operational, for they frequently state what must be done in order to determine the child's I.Q. We must first administer a test of specific kind, then observe his performance on the test and finally make certain calculations and decisions. All of these conditions define the meaning of I.Q., as it appears in the sentence – Ramu has an I.Q. of 115.

It would be certainly of great advantage to have an operational definition of Intelligence that everyone would accept for scientific work and would distinguish it from vague popular conceptions of the terms.
FREEMAN’S (1962) CLASSIFICATION:

1) Adjustment of adaptation ability:

The definition of this category lay emphasis on the adjustment ability of an individual to his environment. The individual is thought intelligent in proportion, to his ability to adjust to new situations and problems of his life. The person who is intelligent has no difficulty in his adjustment. He adjusts in an effective way and can vary his behaviour according to the situation. A person who is less intelligent is rigid and has less response to make in the process of social interaction. The definition given by Stern (1914) comes under this category. He defined intelligence as a general capacity of an individual, consciously to adjust his thinking to new environment.

2) Ability to learn:

The definitions of this category emphasize the importance of an individual’s ability to learn. Learning ability is an index of one’s intelligence.
3) **Ability to carry in abstract thinking:**

This category of definitions lays more emphasis on the effective use of concepts and symbols in dealing with situations, especially presenting a problem to be solved through the use of verbal and numerical symbols. Terman (1921) while defining intelligence says, “An individual is intelligent in proportion as he is able to carry on abstract thinking”.

It should be kept in mind that different categories of definitions are not exclusive of each other, but are interdependent. The division has been made for the convenience of understanding. No doubt, on the surface, these categories appear quite different, but when we critically examine the definitions, we find that learning ability is the basic requisite condition for the other two aspects of intelligence.

Being dissatisfied by a number of definitions and interpretations, Boring (1950) defined, “Intelligence is what intelligence tests test”.

Stoddard (1943) presents a comprehensive description of term ‘Intelligence’. According to him, “Intelligence is the ability to undertake activities that are characterized by:
a) Difficulty
b) Complexity
c) Abstraction
d) Economy
e) Adaptiveness to a goal
f) Social values and
g) Emergence of originals

And to maintain such activities under condition that demand a concentration of energy and a resistance to emotional forces”.

But according to Wechsler (1944), “Intelligence is the aggregate or global capacity of the individual to act purposefully to think rationally and to deal effectively with his environment”.
THEORIES OF INTELLIGENCE:

To clearly define the nature of intelligence, various philosophers and psychologists have developed various theories.

1) Monarchic Theory:

Philosophers developed the monarchic theory of intelligence, who believes that intelligence consists of a single factor which equally works in all the situations of life.

2) Faculty Theory:

Faculty theory is the oldest theory of intelligence and flourished during 18th and 19th century. According to this theory, mind is made up of different faculties like reasoning, memory, discrimination and imagination etc. these faculties are independent of each other and can be developed by vigorous exercise of difficult subject matter. This theory gave rise to a new theory of education called theory of mental discipline.
3) **Two-Factor Theory:**

This theory was developed by an English psychologist Spearman (1904). According to this theory, the intellectual abilities were comprised of two factors – general ability as ‘G’ factor and groups of specific abilities known as ‘S’ factor.

‘G’ factor is universal, inborn ability and general mental energy. It differs from person to person and greater the ‘G’ in a person, more he is successful in his life.

‘S’ factor is the learned and acquired in the environment and varies from activity in same individual. More the ‘S’ factor, more the person is successful in his vocation.

4) **Multifactor Theory:**

It was developed by Thorndike (1962) an American psychologist. He was against the theory of general intelligence and he proposed that there are specific stimuli and specific mental responses and intelligence is just a name for an almost infinite numbers of actual or potential specific connections between these stimuli and responses. This is atomistic theory of
intelligence and according to this, there is no general intelligence. He distinguished four attributes of intelligence:

a) **Level**: This refers to the difficulty of a task that can be solved.
b) **Range**: It refers to the number of tasks at any given degree of difficulty that we can solve.
c) **Area**: It means the total number of situations at each level to which the individual is able to respond.
d) **Speed**: This means the rapidity with which we can respond the test items.

Every intelligence test consists of four attributes. When a person is tested, a certain number of tasks (area) are given which vary in difficulty (attitude) and there are a number of items at each level of difficulty and they are responded in a given time (Speed).

5) **Group Factor Structure of Intelligence**: This theory is based on factor analysis and statistical procedure that attempts to describe as simply as possible the main factors that account for the relationship among
a several different tests. This theory was put forth by Thurstone (1938). According to this theory, intelligence neither consists of two factors as proposed by Spearman nor multi-factors as developed by Thorndike. These six primary factors are as follows:

i. Number Factor (N)
ii. Verbal Factor (V)
iii. Memory (M)
iv. Reasoning (R)
v. Word Fluency (W)

6) Structure of Intellect (SOI) by Guilford (1966):

This theory was developed by Guilford and his associated at the Southern California University in the psychological Laboratory in 1966. The idea of structure of intellect model was formulated in fifties and successively refined and modified until the present model was finally developed in the year 1966.

He suggested that the mind is composed of at least three dimensions, instead of unidimensional model of
intellect. The model is a three way classification of intellectual abilities namely – operations, contents and products.

i. Operations – the act of thinking

ii. Contents – the terms in which we think (Such as words or symbols)

iii. Products – the ideas we come up with.

7) Vernon’s Hierarchy Theory:

Another factor analytic view of the organization of intelligence was developed by Vernon (1950).

According to this theory, intelligence test measure an overall factor ‘G’ as well as two main types of mental abilities:

The major group factors are:

i. Ved: Verbal, numerical and Educational

ii. KM: Practical, mechanical, spatial and physical
These two major factors can be divided into minor group factors, such as mechanical, manual and these minor factors further can be divided into various specific factors.

There are number of theories of intelligence but not a single one is complete. So, the discussion on what intelligence is, continues.

In the present study, intelligence is defined as “the ability to deal with numbers, analogies, opposites and synonyms, to make categories and to show inferences. Its measurement (Verbal) is the total scores on Group Test of General Mental Ability (Tandon, 1971).

2.2 CREATIVITY:

Like intelligence the concept of creativity is also considered vague due to the assign different meaning to creativity and also due to the complex nature of creative experience (Yamamoyo, 1964; Getzels and Dillon, 1973; Barron and Harrington, 1981).
In the past it was more or less synonymous with terms like intention, insight and imagination.

Then other definition of creativity points out that creativity involve the development of something unique, although the uniqueness has not been well defined by different investigators.

Rhodes (1961) and Kneller (1965) have suggested that creativity be defined in terms of person, product, process and press (environment). These definitions emphasize either one or a combination of four aspects – Person, product, Process and Press (environment).

(i) **Person**-

Who creates, that in terms of physiology and temperament including attitude, habits and values. Andrews (1961) defines it as “a positive self integrating force..................’ process of self actualization and expression of being.
Golamn (1963) points to its denotative versatility – “Creativity is a normally distributed trait, an aptitude trait, an intra—psychic and a style of life”.

According to personological approach, Creativity is related to unique cognitive factors (Guilford, 1950, 1957, 1959) and also dependent upon certain non-cognitive factors (Raina, 1971; Gakhar, 1973, 1975; Gupta. 1979).

According to Gilford (1963), “It is a combination of aptitude factors and disposition that enables a person to use his important in novel ways”.

(ii) **Product:**
Creativity is expressed in action, e.g. buildings designed by architects, books written by authors, theories prepared by investigators, paintings made by the artists, etc. According to Israeli (1946), Drevdahl (1956), Stein (1962) and Kavolis (1964), “Creativity is the capacity of the individual by which something new is produced, an idea or an object including a new form or arrangement of old element. In the creativity product uniqueness or novelty is the main element. In some definitions of creativity (Stein, 1953; Rogers, 1954),
novelty has been viewed in tangible products, but certain others (Stewart, 1950; Guilford, 1964) hold that it can also be present in the intangible products.

(iii) **Process:**

The act of the mind that calls into play, motivation, perception, learning and thinking. Stein (1953) defines it as process which results in a novel work that is accepted as tenable or useful or satisfying by a group at some point in time. Harman (1958) defines it as “the process by which something new is produced, an idea or an object including a new form or arrangement of old elements. The new criteria must contribute to the solution of the problem. Creativity as a process has been advocated by Taylor (1958), Kubie (1958), Vinacke (1960), Yamamoto (1964), Torrance (1962), Rogers (1976) Kant (1976), Brown (1977) and Gordon (1982). In the views of Wallas (1926) creative process can be divided into four stages:

a. preparation

b. incubation

c. illumination

d. verification.
According to Taylor (1958) the Walls steps towards creative accomplishment are valid but it is also necessary to recognize the hierarchical levels of creativity which from the lowest to the highest are:

a. Expressive creativity
b. Technical creativity
c. Intentive creativity
d. Innovative creativity
e. Emergentive creativity

Helmoltz ( ) identified the four phases in the creativity process:

- Preparation
- Incubation
- Illumination
- Verification

a) Preparation - involves an inner urge to solve a problem
b) Incubation – this is a period of no obvious activity and progress, the problem is being solved unconsciously
c) Illumination – this is so called “Eureka”. At this stage creative ideas emerged all of a sudden.
d) Verification – it is tested whether new idea found is appropriate or not.

The same four stages have been identified by other writers (Patrick, 1937; Poincare, 1931; Hadamard, 1945; Arnold, 1959). In Mansfield and Busse’s (1962) Model of creative process, also there are five steps towards creativity.

a. Selection of the problem that is important and potentially soluble
b. Extended effort to solve the problem
c. Setting constraints to the solution of the problem
d. Changing the constraints through a restructuring process, and
e. Verification and elaboration of results.

In the view of Torrance (1962) creative process consists of identifying problems, developing hypotheses as to the causes of the problems, find out new solutions, application of these solutions which involve improvement of product and usual uses and finally communicating the results. Verbal Creativity according to him can be measured in terms of fluency, flexibility and originality.
(iv) **Press (Environment):**

It is the process of manipulating the environment, the environment which results in the production of new ideas, patterns or relationships.

Hudson (1966), Torrance (1972) and Vijay Lakshmi (1980) stated that socio-economic status may act as inhibiting/facilitating theories of Kris (1952) and Kubie (1958) emphasize the importance of pre-conscious process. These processes are believed to occur when the ego, with its emphasis on logical, rational thought, temporarily loosens its control of the thinking process so that an unorganized-drive oriented type of thinking can occur. Gestalt psychologists (e.g. Kohler, 1969) employ the term “Productive thinking” and problem solving to refer to what others might have used creative thinking. The structural features of the problem itself set up stresses and strains in the thinker. By following up these stresses and strains, the thinker is led to a restructuring of the problem. Successive restructuring occur until a solution emerges.

Press also contributes towards the creative process and products as considered by Rogers (1962), Torrance
(1965), Hasan and Butcher (1966). Synder (1967), and Goyal (1973) and conditions of psychological safety and psychological freedom should be set up so as to maximize the likelihood of emergence of constructive creativity (Nuss, 1962).

Rogers' (1954) definition of creativity includes all the four concepts suggested by Rhodes (1961) and Kneller (1965). According to him, "it is the emergence in action of producing something uniqueness of the individual (Person) on the other hand, and the materials, events, idea (Process). People or circumstances of his life (Environment) on the other”.

The definitions that are given in terms of person, product, process and press (environment) suggests that creativity also includes four things:

1. Transcendence
2. Originality
3. Adaptability
4. Realization

1. **Transcendence**: means that creative ideas which transform the generally accepted experience of man by introducing new principles.
2. **Originality**: means production of idea.

3. **Adaptability**: is the beneficial change to meet the environmental demand, that is, response in order to be creative should be adaptive to or of reality.

4. **Realization**: is the elaboration of the original idea or an act.

Finally – creativity is the capacity to devise new ideas and see deeper meaning in object, events, interpersonal relationship and symbolic materials.

Regarding nature of creativity, it has different meanings to different people. There is little conceptual clarity and agreement among the investigators as to the nature of and definition of creativity that is the major source of confusion in the creative studies. Different people have different views regarding the nature of creativity.

According to the ‘artist’, creativity is the ability to arise an emotional need which is conducive to creativity. According to ‘architect’ creativity is ability to
produce new forms and new approaches and new materials in the functional design.

According to Mathematicians – creativity is the ability to solve mathematical problems and also useful in creating combinations and that provides knowledge of mathematical law.

According to Scientists – creativity is the ability to provide knowledge and projecting the contrivances which change the course of human events.

According to Social Scientists – creativity is the ability to produce new theories.

Business point of view – Creativity is the capacity to produce fresh, original and valuable ideas. Hallman (1963) explains the five components of creativity which are – The act, object, the process, the person and the environment.

The creativity act, Hallman says:

a) Is a whole act, a unitary instance of behaviour;
b) Terminates in the production of objects or of forms of living which are distinctive;
c) Evolves out of certain mental processes;
d) Occurs within a particular kind of environment.

Hallman called the first of these five components is “Connectedness”.

The second component is “originality”. For the clarification of originality Hallman includes four qualities – Novelty, Unpredictability, Uniqueness and Surprise.

The third component – is “Process” – in general that “certain unconscious mental processes are responsible for the metaphoric function of fusing images into new creations”. Creativity has been explained in three ways, As a process:

a. “as a sequential series of stages of activities;
b. as a vertical level of psychological functions;
c. as types of mental forces”.

Person: is the fourth component of creativity. It is explained in terms of conditions of self actualization. Self – actualization criterion “identifies creativity with self – formation, and therefore implies that unless significant transformation occurs in personality during an activity, that activity will fall short of the creative”, (Hallman, 1963). Environment is the fifth component of creativity has been explained by Hallman that openness includes such traits as self – acceptance, sensitivity, tolerance of ambiguity, and spontaneity, and as the condition of openness which refers to “those characteristics of the environment, both the inner and outer, the personal and the social, which facilitate the creative person’s moving from the actual state of the affairs which he is in at a given time towards solutions which are only possible and as yet undetermined”.

THEORIES OF CREATIVITY:

As far as theories of creativity are concerned Spearman (1931) proposed a special intellectual theory of creative performance. According to Spearman point of view that every creative act is a matter of “educing correlates”. A “Correlate” is a “fundament”, or unit of information, needed to complete a
relationship, when the relation and other unit are given. Spearman described in his theory that creative thinking depends upon a single factor of intelligence; one, or, at the most four (for four kinds of content) out of possible 120. He overemphasized the importance of this one kind of operation and product by virtue of the fact that he thought the Cognition and use of relationships is the essence of the master ability and the essence of the master ability is called 'g'.

Kris (1952) developed a “Psychoanalytic theory of creativity. This is also one of psycho – analytic theories. According to Kris point of view that creative thinking is not conscious and also do not associate creative thinking with unconscious and latter is regarded as stereotyped and restricting. According to him thinking is a function of what they call the preconscious. There is relief from repression so that communication is improved between the id and ego, permitting preconscious though development. Maltzman (1960) and Medmick (1967) are two new proponents of a theory of the associative type. Both evidently too their empirical starting point from the finding that a word association test, with weighted scoring for statistical infrequencies of responses, is a measure of individual differences in the factor of originality.
Medmick (1967) has proposed (elaborated) a theory of originality which is based upon the infrequency principle. He supposes that in connection with each stimulus word, an individual has a hierarchy of potential responses, each response with its own degree of readiness, when the stimulus comes. In this theory, stimulus – response connections are formed.

Mansfield and Bussee (1962) had given two fundamentally different approaches to the study of creativity. First creativity is considered in terms of test performance. The divergent thinking test developed by Torrance (1966) and others too measure divergent thinking ability has often been used as measures of creativity. Divergent thinking test use problem that allow many possible solutions. Researchers who use test to measure creativity assume that the ability being tested are essential to real life creativity and persons with high test scores have high potential for creative accomplishment. Secondly, real life creativity may be measured directly in terms of products such as poems, symphonies, books, inventions and scientific theories.
Associationist theories involve the common assumption that creativity results from unusual or novel association. (Koestler, 1964; Gruber, 1974; Medmick, 1967;) defined the creative process as “The forming of associative elements into new combinations which either meet specified requirements or are in some way useful”, when highly creative people are asked to respond to a stimulus word then he gives remote or uncommon responses; on the other hand less creative people respond to stimulus word then he gives only common stereotyped responses. The degree of creativity depends on the relative remoteness of the elements used to form the new combinations.

Hadamard (1945) theory combines psychoanalytic as well as associationist ideas. According to Hadamard point of view all thinking is unconscious because thinking cannot be observed and reported by thinker himself like Walllas. He proposed four steps in creative process – preparation, incubation, illumination and verification. Preparation, i.e., a inner urge to solve a problem and preparation period is conscious, systematic and logical. Incubation is that period no obvious activity and progress. The problem is being solved unconsciously. Preparation period sets in motion some unconscious thinking
processes that are essential to the incubation and illumination phases. The unconscious mind first produces number of associations and then selects only potentially meaningful or fruitful ideas for their beauty. Which are allowed to reach consciousness in the phase of illumination. Illumination, i.e., at this stage creative ideas emerged all of sudden. Last step in creative process is verification, i.e., it is tested whether new idea found appropriate or not and verification of the value of ideas and establishing its implications, is essentially conscious.

Koestler (1977) developed a “bisociation” theory of creativity. In bisociation, two independent matrices of ideas come into contact, but this occurs only sub consciously through a repression to the pre-conscious thinking processes stressed by psychoanalytic theorists.

Gruber’s (1974) theory draws on the associationists and Gestalt positions as well as on Piaget’s theory of cognitive development. According to Gruber’s point of view that accomplishments are fueled by conscious, purposeful action. Creative thought is preceded by a period of persistent search enquiry. After such a period, idea or discovery can occur.
Discovery results not from a single association but from a succession of small changes or restructurings.

For the purpose of present study creativity has been operationally defined as "the process of sensing gaps or disturbing missing elements; forming ideas or hypotheses concerning theory; testing these hypotheses and communicating the results; possibly modifying and retesting the hypotheses (Torrance, 1966). Its measure is the total scores on fluency, flexibility and originality as measured by Creative Acts Check List (Torrance, 1962). Fluency is the ability to call up relevant ideas where the quantity and not the quality, is emphasize. It is the total number of relevant response i.e. the total number of response given by the subject minus the number of duplicate and irrelevant responses. Flexibility is the ability to produce diversity of idea and with a number of shifts. Originality is the statistical infrequency of responses or the extent to which the responses deviate from the obvious and the common.

2.3 MATHEMATICAL CREATIVITY

Creativity in mathematics is the study of the cross effect of symbolic content and divergent production over
the aspects of operations as given in Guilford Structure of Intellect Model. In other words, it is the cross effect of symbolic content and divergent ideas over the different aspects (or act) of thinking.

Defined differently, creativity in the field of mathematics is called mathematical creativity.

2.4 ACADEMIC ACHIEVEMENT

Academic achievement of the pupils continues to be the primary concern and the most important goal of education despite many varied statements about the aims of education. Academic achievement is also considered to be the main area of educational research by the researchers. Stephens (1960) states, “Not that other aspects of educational objectives are to be ignored but the fact remains that academic achievement is the unique responsibility of all educational institutions established by the society to promote a wholesome scholastic development of the pupils”.

According to Crow and Crow (1956) “Achievement means the extent to which a learner is profiting
from instruction in a given area of learning. In other words, achievement is reflected by the extent to which skill or knowledge has been acquired by a person from the training imparted to him; it is the outcome of general and specific learning experience. Therefore, the special acknowledgement of a person's skill, the range and depth of his knowledge or his proficiency in designated area of learning or behaviour is indicative of the extent of his achievement.

In view of Good (1959), Biswas and Aggarwal (1971), there seems to be considerable similarities in as much as all of them place emphasis on knowledge attained or skills developed in the academic subjects usually designated by test scores. In other words, academic achievement refers to the degree or level of success or proficiency attained in some specific area concerning school or academic work.

Pressey, Robbinson and Horrock (1959) define achievement as "the status or level of person's learning and his ability to apply what he has learned". According to them achievement would not only include acquisition of knowledge and skills but attitudes and values as aspects of achievement. Achievement as manifested by the application of acquired skills
and knowledge is a product of learning attitudes and interests since these factors would implicitly influence the extent of achievement. According to Travers (1964) the term refers to any desirable learning that occurs. It is obvious that whether a particular learning is referred to as an achievement or not, depends upon whether somebody considers it desirable or not. Hence, any behaviour that is learned may come within a definition of achievement.

Good (1973) defines academic achievement as "knowledge attained or skill developed in the school subjects, usually designated by the test scores or by marks assigned by the teacher or both".

The need for measuring academic achievement is based on two fundamental assumptions of psychology. First, there are differences within the individual from time to time known as behaviour oscillation i.e. academic achievement of the same individual differs from time to time, from one class to another and from one educational level to another. Secondly, there are individual differences. Individuals of the same age group, of same grade, usually differ in their potential abilities and academic proficiency whether these are
measured by standardized measure of achievement by teacher’s grading or by marks obtained in tests and examination.

In the present study, mathematical achievements of the students were measured by giving test in the subjects of mathematics.

2.5 SOCIO-ECONOMIC STATUS:

The term ‘Socio-Economic Status’ has been defined differently by different educationalists.

According to Dictionary of Education by Good (1973), socio-economic status is as “socio-economic rank or position of the individual in the group, to which he belongs. He may have acquired it or may be born to it”. In other words, a set of potentially influential factors generally associated with home is called the SES of the child.

Chambers’ 20th Century Dictionary (1970) meaning of socio-economic status is “a state, condition or a standing of a person”.
Green et al. (1971) defined SES as “a position in a social group or grouping in relation to other positions held by other individuals in the group or grouping”. Thus SES refers to social and economic standing. A person who has a high standing in the community and good income and who lives in a well-furnished house of good quality and have an ample opportunities is said to have good socio-economic status.

In this way, the social standing or the prestige of a person in his group or of the group in the community; the position that a person or group holds in public esteem is the social status. Economic status may be determined by the size or the source of one’s income. Social prestige cannot be ensured by the economic status alone. Although determined by race, religion, nationality, family or other factors. Economic status may partly rest on wealth.

In the present study as the subjects are just adolescents, so at this stage, the socio-economic status of one’s parents exercises a decisive influence on one’s ability of creativity.
For the purpose of present study, socio-economic status of the subjects is the measures of total scores obtained on socio-economic status scale by Kulshrestha (1980).

2.6 URBAN – RURAL DIFFERENCES (DOMICILE)

According to Webster’s New Dictionary of Education (1981), domicile is the actual dwelling place that is one’s permanent or principal home or the place of residence of an individual or family. Here domicile refers to urban/rural differences of the students.

The main distinction between rural and urban setting may be that in rural setting we get primary products, e.g. sugarcane, wheat etc. wherein urban setting we get secondary products, i.e., sugar, oil etc. In other words, urban denotes a distinct quality of human community, a special mode of existence or way of life which is characteristic of the city. Thus, the students who study in urban schools and colleges are considered to be urban students, whereas a Society or community may be classified as rural which as less population, less social differentiation, slower rate of social change; agriculture as a
major occupation. The students who are studying in rural schools and colleges are considered to be belonging to rural group.

The role of urban and rural environment in accelerating the acquisition of concepts and enhancement of creative abilities is of paramount importance. Good environment accelerates activities and leads to better outcome. What has generally been found is that children of rural parents and rural communities have low level of educational aspirations and expectations.

As the living conditions in urban and rural areas are different, therefore, it is expected that rural – urban differences may affect the mathematical creativity of the students.

For the present study, the children who are living and studying in the town or cities are defined as urban whereas rural children are those who are studying in those institutions which are established in rural areas, are living in rural areas and who have rural background.