The Variables
Design of the Study
Procedure
A. Sampling
   (i) Selection of the Institutions
   (ii) Choice of the Sampling
   (iii) Type of the Sampling
   (iv) Size of the Sampling
   (v) Justification of the Sampling
B. Operational Procedure
   (i) Selection of the Tools
   (ii) Administration of the Tools
   (iii) Scoring of the Tools
C. Data Processing
The present study strives to investigate into the problems of students in professional courses of Medicine, Law, Engineering and Education and to find out their relationship with personality factors. It is evident that to fulfil this aim of study, 'Survey' is the best suited method which Good Bar and Scates (1941) have called 'Normative Survey Method' but Best (1978) has named as Descriptive Research Method, whereas Travers (1958) has labelled as 'Survey Method'. The term Normative Survey is generally used to that type of research which aims at ascertaining what is normal or typical condition or practice at the present time. Moreover, in a Normative Survey Method results are inferred on the basis of assessing variables through standardised tools. Therefore, the investigator decided to work through the Normative Survey Method of research.

Normative Survey Method has been used in the present study because the main purpose of the study is to identify the existing problems of the students of the four professional courses and to relate them to their personality factors. Thus, the present study aimed at ascertaining the present conditions and determining relationships and does not propose to study past or future events as is done in the case of historical or experimental studies. The present study is not designed on
experimental lines due to many reasons. First, it being an investigatory type of study, the main proposed objective of the study is to estimate the degree of difference and relationship among different variables. It does not propose to determine the effectiveness of a particular process or programme. Thus, the proposed objective cannot be achieved through experimental but Normative Survey Method. Secondly, the researcher did not propose to manipulate the variables or environmental conditions and thus, thereby arrange for events to happen. In fact the problems that are identified would have been present even if there had been no analysis because it involves problems which are already present and their relationship is to be determined. Moreover, it is a behavioural study and, therefore, in order to study cause and effect relationship, it is ethically unsound to manipulate the variables and thereby exposing human subjects to harmful situations. Therefore, Normative Survey Method is considered to be an appropriate method particularly in behavioural studies. Thirdly, experimental research can successfully be done on a small number of cases but survey studies may be done on a larger sample. The conclusions drawn and generalisations made on the basis of a study conducted relatively on a large sample are more accurate than on the basis of a small sample.

Survey Method was preferred over case studies also because in a survey method data is collected from a relatively large number of cases and is not confined to the study of a few individuals. In case studies the focus of attention is
directed towards a limited number of cases and hence assumes limited meaning.

Therefore, survey method is an important and useful method of studying educational problems. Moser and Kalton (1977) viewed,

"Surveys thus have their usefulness both in leading to the formulation of hypothesis and, at a more advanced stage, in putting them to test."

Moreover, it is not merely limited to gathering and tabulation of data. The simplest survey attempts only frequency counts of events while the more complex seeks to establish relationship between them. According to Best (1978), survey requires expert and imaginative planning, careful analysis and interpretation of the data gathered, and logical and skillful reporting of the findings.

A. THE VARIABLES

The following variables have been included in the present study:

(1) The variable of Professional courses of Medicine, Law, Engineering and Education (Teaching).

(2) The Personality variables of Personality Adjustment, Self Concept (self acceptance), Level of aspiration and Creative Potential.

(3) The Variables of Students' Problems.

The variables are generally classified as independent,
dependent and moderator variables.

1) **INDEPENDENT VARIABLES**

An independent variable is also called a stimulus variable or input. It is that factor which is measured, manipulated or selected by the experimenter in order to determine its relationship to an observed phenomenon. It is the variable that will be manipulated or modified to bring a change in some other variable. It functions either within a person or within his environment to affect his behaviour. The investigator considers it independent because she is concerned only in how it affects another variable, not in what affects it. In the present study all the four professions are independent variables.

ii) **DEPENDENT VARIABLES**

The dependent variable which is also known as a response variable or output is an observed aspect of behaviour. It is the factor which is observed and measured to determine the effect of the independent variable, that is, the factor that appears, disappears or is modified on introducing, removing or changing the independent variable by the experimenter. In the present study students' problems are the chief dependent variable and four of the personality factors are the secondary dependent variables.

iii) **MODERATOR VARIABLES**

It is a special type of independent variable - a secondary independent variable selected for a study to determine
its effects on the relationship between the primary independent and the dependent variables. It refers to that factor which an experimenter measures, manipulates or selects in order to find out whether it changes the relationship between independent variable and an observed phenomenon. In order to understand the nature of relationship between independent and dependent variables properly moderator variables should be measured in a study. Therefore, Tuckman (1972) emphasised,

"Because the situations in educational research and investigations are usually quite complex, the inclusion of at least one moderator variable in a study is highly recommended."

When a researcher fails to single out and measure vital moderator variables - high or low intelligence, or high or low achievement and so on, the nature of relationship between independent and dependent variables remains poorly understood. In this study the problems, as well as the four personality factors, worked interchangeably as moderator variables when high and low groups in problems and high and low groups on other personality factors were formed.

The main aim of the study was to study the problems of students studying in the four professions, therefore, the researcher wanted to know, 'Do the professions have any effect on the problems of the students?'. Thus, it was essential to consider the professions as 'independent variables'. The personality factors of Personality adjustment, Self Concept (self acceptance), Level of aspiration and Creative Potential
were also studied in relation to the professions and the problems. As professions were considered the 'Primary Independent Variable' and Problems the 'Dependent Variables', the other personality variables were considered as the 'Secondary Dependent Variables'. For studying problems in relation to these secondary dependent variables, each professional group was divided into two extreme groups on each of the four personality variables. Therefore, these personality variables worked as moderator variables i.e., Secondary independent variables and problems were analysed on the basis of these moderator variables (extreme groups on personality variables). For further analysis, problems were considered as moderator variables and the personality factors were considered as dependent variables with respect to different professions (Primary Independent Variables). Therefore, for multiple analysis of the data the researcher had interchanged (manipulated) the variables to achieve the objectives of the study.

B. DESIGN OF THE STUDY

The research design adopted for the study included the following phases:

(i) Identification of the problems of the students in the four professional courses.

(ii) Assessment of the personality adjustment, Self acceptance, Level of aspiration and Creative Potential of the students of the four professional groups and the whole sample.
(iii) Location of high and low groups in Problems, Personality adjustment, Self acceptance, Level of aspiration and Creative Potential of the students of the four professional groups and the whole sample.

(iv) Testing the significance of difference between high and low problem groups on different personality factors of the students of different professions and the whole sample.

(v) Testing the significance of difference between the problems of high and low groups on each of the personality factors of the students of different professions and the whole sample.

(vi) Testing the independence of different types of problems among different professional groups.

(vii) Determining the degree of equal distribution of area-wise problems in different professions.

(viii) Determining the degree of correlation between problems and the four personality factors.

(ix) Determining the degree of intercorrelation among different personality factors.

(x) Determining the significance of difference between the Psychological Profiles of the highest and the lowest achievers on the Problem-Checklist.

C. PROCEDURES

The procedure adopted for the present study consisted of the following Phases:
(A) **SAMPLING**

(i) Selection of the institutions.
(ii) Choice of the professional courses.
(iii) Type of the sampling.
(iv) Size of the sampling.
(v) Justification of the sampling.

(B) **OPERATIONAL PROCEDURE** (Collection of the data)

(i) Selection of the tools.
(ii) Administration of the tools.
(iii) Scoring of the tests.

(C) **DATA PROCESSING**

The present study endeavours to investigate into the relationship of the problems of the students in professional courses of Medicine, Law, Engineering and Education (Teaching) in relation to their personality factors. The population of the study is comprised of the following institutions:
### TABLE - 1

**Details Of The Institutions And No. Of Students**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Deptts./College</th>
<th>University</th>
<th>No. of Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Engineering College</td>
<td>A.M.U.</td>
<td>250</td>
</tr>
<tr>
<td>2.</td>
<td>J.N. Medical College</td>
<td>A.M.U.</td>
<td>200</td>
</tr>
<tr>
<td>3.</td>
<td>Department of Law</td>
<td>A.M.U.</td>
<td>150</td>
</tr>
<tr>
<td>4.</td>
<td>Department of Law, D.S. College</td>
<td>Agra</td>
<td>75</td>
</tr>
<tr>
<td>5.</td>
<td>Department of Law, S.V. College</td>
<td>Agra</td>
<td>75</td>
</tr>
<tr>
<td>6.</td>
<td>Deptt. of Education</td>
<td>A.M.U.</td>
<td>80</td>
</tr>
<tr>
<td>7.</td>
<td>Deptt. of Teachers Training, D.S. College</td>
<td>Agra</td>
<td>120</td>
</tr>
<tr>
<td>8.</td>
<td>Deptt. of Teachers Training, S.V. College</td>
<td>Agra</td>
<td>70</td>
</tr>
<tr>
<td>9.</td>
<td>Deptt. of Teachers Training, T.R. College</td>
<td>Agra</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1100</strong></td>
</tr>
</tbody>
</table>

The above table shows that the data was collected from all the local institutions providing facilities for teaching for the professional courses of Engg., Law, Medicine and Teaching.

(A) **SAMPLING**

(1) **SELECTION OF THE INSTITUTIONS**

It is not feasible to investigate into any
phenomenon on the entire population. Thus, representative sample of the population has to be selected. In every branch of science we lack resources to study more than a fragment of the required population. Therefore, the present study was conducted on 1,100 students of 2,800 total number of students enrolled in Medical, Engg., Law and Teaching courses provided in various institutions of Aligarh City, keeping in view the objectives, the time and resources available. Out of these 1,100 students, a sample of 800 students was finally selected for the study, thus, discarding 300 cases whose data on some of the tests was incomplete. The study was conducted on both male and female students of the above mentioned professions.

The students studying in different professional courses of the various institutions of A.M.U. and other affiliated colleges of Agra University in Aligarh City were only selected. The selection of the institutions was made on the following criteria:

(a) Aligarh Muslim University represents unbiased sample of students drawn from all over India because it is a Central University of national character.

(b) The students, from various communities and regions, belonging to the families of different socio-economic and cultural strata, study in these institutions. Thus, they are fairly representative of the general student population studying in these professional courses in India.

(c) The cooperation of the institutional authorities of different professional disciplines was easily sought at
the local end.

(d) The administration of different tests was convenient at the local level.

(ii) CHOICE OF THE PROFESSIONAL COURSES

It has already been mentioned (P.1) that the Medicine, Law, Engineering and Education (Teaching) are the four prestigious professions in the society. Moreover, they are significant for the national reconstruction and development. Therefore, all the professional courses preparing for the aforesaid professions were selected. In Medical group the first year students were excluded and in Engg. the students from third semester onwards only were included in the investigation because they were considered to be properly familiar with the educational and training programmes of their respective professional courses and were also of equal maturity. They were considered mature because the students in Medical and Engg. courses are admitted after completing Intermediate or B.A./B.Sc. and some students even join after doing M.A./M.Sc. Therefore, the investigator had tried to equate the level of maturity of the students by excluding the freshers from the study.

(iii) TYPE OF THE SAMPLING

The sample was randomly selected and appears to be a proper representative of various communities, regions, socio-economic and cultural strata. The general age range of the students was between 19 and 24 but some of the students
studying in B.Ed. and Law were between the age range of 25 and 30 years. It has been found that some experienced students also join these professional courses. But looking to the nature of the study, it was felt that inclusion of a small number of the students of higher age would not affect the results of the study. Moreover, the variable of age was not strictly controlled, either experimentally or statistically, because experience has shown that age as reported by the students is extremely unreliable.

The subjects included in the sample were from families of different socio-economic status. Their parents belonged to different income and occupational groups such as business, farming, clerical jobs and professions like teaching, law, engineering, medicine and accountancy etc. Their income ranged from Rs. 300/- to Rs. 3,000/- per month. The subjects came from rural as well as urban areas. Many of the students were from different states of the country. Therefore, the sample appeared to be fairly representative of different communities, regions, socio-economic and cultural strata.

(iv) SIZE OF THE SAMPLE

The size of the sample, to begin with, was 1,100 out of which 800 students were finally selected, thus, discarding 300 cases as their psychological data on some of the tests was incomplete. Out of 300 cases rejected, 160 were from the Law group alone. The investigator failed to contact them later as they were absent during the subsequent administrati
of the tests. The number of students selected from different professional courses is given below:

**TABLE - 2**

The Number Of Students Selected From Each Professional Group

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Group</th>
<th>Total No. enrolled</th>
<th>Total No. appeared</th>
<th>Percentage</th>
<th>Total No. selected</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Medical</td>
<td>250</td>
<td>200</td>
<td>80</td>
<td>175</td>
<td>70</td>
</tr>
<tr>
<td>2.</td>
<td>Law</td>
<td>1500</td>
<td>300</td>
<td>20</td>
<td>140</td>
<td>9.3</td>
</tr>
<tr>
<td>3.</td>
<td>Engineering</td>
<td>600</td>
<td>250</td>
<td>41.7</td>
<td>195</td>
<td>32.5</td>
</tr>
<tr>
<td>4.</td>
<td>Education</td>
<td>450</td>
<td>350</td>
<td>77.7</td>
<td>290</td>
<td>64.4</td>
</tr>
<tr>
<td></td>
<td>(Teaching)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>2,800</td>
<td>1,100</td>
<td>39.3</td>
<td>800</td>
<td>28.6</td>
</tr>
</tbody>
</table>

The above table indicates that around 30 percent of the total population was finally included in the study. Medical and Education had the maximum representation with their percentages being 70 and 64 respectively. Thus, the sample represented the total population to a considerable extent.

(v) **JUSTIFICATION OF THE SAMPLE**

The present study was conducted on the students of all the professional courses studying in various Deptts. and educational institutions of A.M.U. and all the three local colleges affiliated to Agra University on whom the group inventories and tests of students' Problem Checklist, Personality
Adjustment Inventory, Self Acceptance Scale, Level of Aspiration Test and Ideational Tendency Scale were administered in their normal class periods. The investigator visited each Deptt. and college a number of times for making arrangements and for the administration of the tests. Thus, the number of 1,100 students selected out of 2,800 was a large number. It took more than six months to collect the required data. The reason for taking so much time on data collection was beyond the control of the investigator because the testing programme had to be suspended a number of times in between due to holidays, class tests, examinations, excursions and some other academic pursuits of the Deptts. and the institutions from where the data was collected.

Similarly, a lot of time was consumed and labour involved in scoring, analysing and interpreting data. Moreover, major part of the total time spent was involved in administering and scoring open-ended tests of creativity because in these tests scoring is excessively tedious and time consuming. Therefore, the size of the sample which comprised nearly 40 percent of the total population may be satisfactorily justified.

The following table shows a complete list of tests used and variables selected for the present study with a letter code designation (abbreviations) of the terms used for the tests and variables.
### TABLE - 3

**Letter Code Designation (Abbrev.) Of The Terms Used For The Tests And Variables**

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Terms of tests, variables, Groups</th>
<th>Letter Code Designation (abbrev.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>S.A. Scale</td>
<td>S.A. Sca.</td>
</tr>
<tr>
<td>6.</td>
<td>Problems</td>
<td>Probs.</td>
</tr>
<tr>
<td>8.</td>
<td>Level of Aspiration</td>
<td>L.A.</td>
</tr>
<tr>
<td>9.</td>
<td>Self Acceptance</td>
<td>S.A.</td>
</tr>
<tr>
<td>11.</td>
<td>High Problems</td>
<td>H.P.</td>
</tr>
<tr>
<td>12.</td>
<td>Low Problems</td>
<td>L.P.</td>
</tr>
<tr>
<td>13.</td>
<td>Highly Adjusted</td>
<td>H.A.</td>
</tr>
<tr>
<td>14.</td>
<td>Highly Maladjusted</td>
<td>H.M.A.</td>
</tr>
<tr>
<td>15.</td>
<td>High Self Accepting</td>
<td>H.S.A.</td>
</tr>
<tr>
<td>16.</td>
<td>Low Self Accepting</td>
<td>L.S.A.</td>
</tr>
<tr>
<td>17.</td>
<td>High Aspiring</td>
<td>H.As.</td>
</tr>
<tr>
<td>18.</td>
<td>Low Aspiring</td>
<td>L.As.</td>
</tr>
<tr>
<td>20.</td>
<td>Low Creative</td>
<td>L. Cre.</td>
</tr>
</tbody>
</table>
B. OPERATIONAL PROCEDURE (Collection of the data)

(1) SELECTION OF THE TOOLS

The success of every research depends upon the selection of the appropriate tools for the collection of relevant data. In the Normative Survey research tools, which are commonly used, are psychological tests, observations, enquiry forms, interviews, socio-metric measures etc. In the present study five psychological tests and inventories were administered by the investigator on the students of different professional courses of Medicine, Law, Engg. and Education which are described as under:

(a) STUDENTS' PROBLEMS CHECKLIST

1) Selection And Description Of The Sts. Probs. Che

The Students' problems can be identified through many techniques. According to Garrison (1965), the methods most frequently used in the studies of Probs. of students consist of interviews, written essays and Probs. Chec. Interview is a good but a time consuming process. As it requires face to face communication, a boy or a girl feeling shy may not open up frankly and freely. Hence the use of interview as a method of study was ruled out. Another method considered for locating students' Probs. was 'Essay Writings'. In this method students are called upon to write an essay on some topic. It is expected that they may express their Probs. in their own words. This may in a way be regarded as a projective technique where the subjects' own feelings and reactions are expressed in an indirect
way. In this method the Probs. of inhibition is minimised. But it, however, requires good power of expression. Therefore, it was felt that those who are linguistically weak, being handicapped by poor power of expression, may not depict the true picture of their Probs. Thus, it was felt that the students may express themselves freely, unhesitatingly, even with less of linguistic ability through a Prob.Ghec. Moreover, it gives a 'census count' of the Probs. of each individual which can be utilised in various ways. The information supplied by the checklist can be of great assistance in counselling procedures. It can also be used with advantage for investigating the Probs. which cause anxiety and tension in day to day work.

Hence the die was cast in favour of using Probs. Chec. The students Probs. Inv. or Chec., as may be called, is one of the important tools for systematic identification of the Probs. of an individual student or a group of students at a given time. When properly filled in, it gives valuable information about them. But the fruitful utilisation of the inventory is limited to the extent of individual or group of students' awareness of their Probs. and, moreover, their willingness to cooperate in disclosing themselves. The investigator tried to the best of her ability to overcome this limitation and sought the testees' willing cooperation and won their confidence.

The Probs. Chec. have been devised both in India and abroad. The investigator, rather than constructing a checklist, preferred to use a prepared checklist because checklist
construction was thought to be both time and labour consuming process. Moreover, checklist construction was not the explicit aim of the study. Thus, the investigator - after thoroughly going through many Probs. Chec. prepared and used in India such as Verma's Youth Problem Inventory, Bagia's Problem Checklist - finally decided for an adapted version of Mooney Checklist prepared by the Educational and Vocational Guidance Centre of A.M.U. in both Hindi and Urdu languages. This Probs. Chec. has been designed for a deeper probe into the Probs. of students. It fully covers educational, vocational, social, emotional and such other Probs. that hamper and retard the welfare of the student community. It embraces many significant spheres of the life of a student.

According to the manual, in the construction of this checklist first hand information was collected about the students' Probs. with special reference to their socio-economic and cultural conditions. Moreover, the information was also gathered from psychologists, parents and teachers. Similarly, many discussions with the students and teachers were arranged in order to collect number of Probs. encountered by them. Thus, Probs. collected from different sources were sent to different judges. Their observations were reviewed and analysed. The list was then revised in the light of their suggestions. This revised list was finally given to a number of University students to see how far the Probs. included in this checklist were a representative sample of the Probs. faced by them.
These Probs. covered almost all the areas of students' activities and are arranged systematically under different categories. It includes 200 items consisting of 10 areas and 20 Probs. in each area. The areas which are included in the list are:

2. Financial.
3. Social and Psychological Relations.
4. Personal and Psychological Relations.
5. Sex and Marriage.
6. Home and Family.
8. Adjustment to College work.
10. Vocational and Future Plan.

ii) Reliability And Validity

The tests which are designed to predict behaviour can be validated by comparing their results with some appropriate outside criteria. But the Probs. Chec. differs from other Personality tests because it is not a test but merely a record of the Probs. Thus, it does not yield test scores and is not based on principles governing test construction. To quote Mooney and Gordon, "A single overall index of the validity of the checklist, would be, therefore, meaningless."

The validity of the Chec. can only be inferred from
their usefulness in terms of assumption on which they are built and the purpose for which they are intended. The investigator would venture to add that if the scores or, to be exact, the frequency of Probs. as indicated in the Chec. show relationship with other behaviour or personality variables, the Chec. could be regarded as valid or, for that matter, reliable. Moreover, it gives comprehensive coverage of Probs. confronted by students and most of the Probs. included in the Chec. were freely reported by the students.

The well known methods for determining reliability such as test-retest, split half and equivalent form method assume that scores on the whole test or on the half tests are meaningless measures which reflect the standing or competence of the individual in the area measured. Moreover, it may be pointed out that these measures are not applicable to like Probs. Chec. at a longer interval as it mainly intends to reflect the Probs. of students at a specified period of time and the Probs. world of any individual is a dynamic inter-relation of changing situations and experiences.

As the Probs. Chec. was designed after the pattern of Mooney Checklist, the Probs. of reliability and validity have also been discussed and accepted according to the suggestions contained in it. However, the investigator herself tested the reliability of the Probs. Chec. by test-retest method. The same Chec. was administered to a group of students twice on different occasions at an interval of nearly one month.
The test-retest reliability co-efficient of Probs. Chec. when computed came out to be \( .81 \) (No=40).

(b) **PERSONALITY TESTS**

In the present study the four personality tests i.e., Pers. Adj. Inv., S.A. Sca., L.A. Cod. Tes. and Ide. Ten. Sca. were used. Since total personality often appears too complex for measurement or experimental purposes, much effort has been extended in breaking it up into elements which can be more easily studied. Instead of working with 'types' of complex wholes, most personality investigations have studied certain attributes of the whole such as physical, mental, social and emotional traits.

According to Cattell (1946, 1957), there are three media-ratings (life record data), questionnaire (self analysis), and objective test to measure personality. For the present study the investigator had used both self reports, questionnaire and performance tests. Sts. Probs. Chec., Pers. Adj. Inv., S.A. Sca. are categorised as questionnaires and self reports respectively and L.A. Cod. Tes. and Ide. Ten. Sca. come under the category of Performance tests of Level of aspiration and creativity.

(i) **PERSONALITY ADJUSTMENT INVENTORY**

1. **Selection And Description Of The Inventory**

In the present investigation Pers. Adj.
does not mean 'the way a person conforms to what society demands' as has been defined by Jersild (1957) but it means the smooth and harmonious relationship between an individual and his environment. Here environment means both external or social and internal or psychological or behavioural environment in which the individual interacts in terms of ego, needs, interests and values.

The Probs. of Pers. Adj. has been studied through various approaches by many social, clinical and educational psychologists. These various approaches ranged from observing individual conduct, asking others for their opinions about him, questioning the individual about his present behaviour and his past experiences so as to find out how persons perceive different situations. The methods used are known as Personality Questionnaire, Rating Scales, Personality Tests, Projective Techniques etc. These different approaches can broadly be categorised into two parts. One is an objective or external approach in which adjustment of an individual is studied from the point of view of an outside observer. The other is from the individual's point of view. The objective approach is called by Rogers (1954) 'the client centred approach' wherein the behaviour of an individual is observed from the point of view of an outside observer and is evaluated in terms of some external criteria of normalcy in behaviour and reaction. These may include the behaviour observed in the laboratory or in every day situations, ratings by acquaintances and experiments of many kinds. Under the 'subjective approaches' any form of
self report whether in autobiography, in self rating or in an interview, may be included. Therefore, the 'tool' used for measuring Pers. Adj., in the present study, comes under the category of personal 'subjective' or 'phenomenological' approach of studying personality.

For measuring Pers. Adj., foreign test materials were not considered because they were found unfit to serve the purpose on account of marked differences between the social, cultural, economic and religious aspects of life in India and the countries where these tests have been standardised. As regards Indian made tests, Asthana's Inventory was consulted which consists of 40 items and was standardised on a sample of 167 individuals. This inventory is concerned mainly with separating the normals from the neurotics. Moreover, many other Adj. Inv. like Sinha and Singh's adjustment inventory, Srivastava and Tiwari, and Promod Kumar's inventories could not be considered because they were not available in Urdu language. Another inventory prepared in India, an adaptation of the Bell's Adjustment Inventory (student form), is called the Aligarh Personality Inventory. This inventory has been adapted by Educational and Vocational Guidance Centre, Deptt. of Psychology, Muslim University, Aligarh. It was considered to be suitable for the purpose of the present investigation mainly because it is comprehensive and it has been adapted to Indian conditions and has also frequently been used in Aligarh City. This inventory is available in both Hindi and Urdu languages. This inventory consists of
five areas, namely, social, emotional, health, family and financial having 90 items in total inventory, each area consisting of 20 items except the financial which had only 10 items.

2. Standardisation Of The Inventory

The standardisation of a test consists of the establishment of uniform conditions for administering the test to all individuals as well as uniform method of evaluating responses. A standardised test is standardised in the form of construction, in the way it is administered and evaluated and its norms. The fundamental purpose of standardising a psychological test is to establish its reliability and its validity at as high a level as possible.

The inventory used in the present study was standardised on 1,086 male and 216 female students randomly selected from the various residential units and non-residential centres. The age range of subjects was from 15 to 28 years. The sample consisted of Hindu, Muslim and Sikh students of the university. The students enrolled in different faculties were included in the sample which covered all classes from the pre-university to the post-graduate level. Nearly 700 students who had filled in the inventory were clinically interviewed. In order to supplement the findings of clinical interviews, TAT pictures were also used on certain individuals. On the basis of clinical interviews and analysis of TAT theme, the interviewer assigned the ratings A, -A, B, C, -C. A represented 'Highly Adjusted',


- A 'Adjusted', B 'Average Adjusted', C 'Maladjusted' and C 'Highly Maladjusted'.

3. Reliability

A good test measures what it claims to, consistently, objectively, discriminately with a minimum expenditure of time, energy and money. Thus, two essential qualities of 'sound test' are its validity and reliability. Reliability is used to mean dependability. In educational measurement reliability is used for two specific concepts, the reliability of statistics and reliability of measurement. Here the investigator is concerned with the reliability of measurement. A test which is reliable will yield approximately the same result upon repeated administration or when two closely comparable forms of the tests are administered. The author of the test reported the following reliability indices by split-half method corrected by Spearman Brown Formula:

\[
\text{Reliability Coefficient Of The Different Areas Of The Personality Adjustment Inventory}
\]

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Area</th>
<th>Value of split-half Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Social</td>
<td>.77</td>
</tr>
<tr>
<td>2.</td>
<td>Emotional</td>
<td>.87</td>
</tr>
<tr>
<td>3.</td>
<td>Health</td>
<td>.85</td>
</tr>
<tr>
<td>4.</td>
<td>Home</td>
<td>.89</td>
</tr>
<tr>
<td>5.</td>
<td>Financial</td>
<td>.87</td>
</tr>
</tbody>
</table>
The values of the inter-area correlations vary from .23 to .98. The investigator tested the reliability coefficient of personality test by test-retest method. It came out to be .81 (No. .42) at an interval of one month.

4. Validity

The validity of a test depends upon the fidelity with which it measures whatever it claims to measure. Validity is the extent to which a test does the job for which it is used. Therefore, validity depends upon purposefulness of a test. Validity is always for measurement of a particular variable. That is why there is nothing like general validity or absolute validity.

The validity of the Pers. Adj. Inv. was calculated both by the internal consistency method and by taking the rating of the clinical interview as an external criterion on 220 cases randomly selected out of nearly 700 cases. Thus, the calculated validity of the test with the ratings of the clinical interview as reported in the manual came to be .59 and the adjusted value of contingency coefficient was found to be equal to .71. The high relationship between interview rating and inventory score suggests that these were classified maladjusted or adjusted by interview were also found to be maladjusted, or adjusted by the adjustment inventory. Thus, we may say that the adjustment inventory is a valid measure of adjustment and maladjustment. The author reported the following internal consistency (inter area correlation) of the inventory:
The Inter-Area Correlation Of The Personality Adjustment Inventory

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Social</th>
<th>Emotional</th>
<th>Home</th>
<th>Health</th>
<th>Financial</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Social</td>
<td>.86</td>
<td>.23</td>
<td>.57</td>
<td>.24</td>
<td>.93</td>
</tr>
<tr>
<td>2.</td>
<td>Emotional</td>
<td>.84</td>
<td>.91</td>
<td>.76</td>
<td>.98</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Home</td>
<td></td>
<td>.63</td>
<td>.66</td>
<td>.87</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Health</td>
<td></td>
<td></td>
<td>.53</td>
<td>.94</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Financial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.84</td>
</tr>
</tbody>
</table>

These analyses have shown that the inventory is a reliable and valid measure of the extent of adjustment.

5. Norms

The raw scores obtained by an individual on a test does not, in itself, have much significance. Thus, raw scores must be translated into norms, which show how a student's performance on the test compares with that of others of his age or grade. Norms are the levels of performance on a test obtained by a defined group of pupils. They differ from standards in that they describe what is rather than what should be. Raw scores are converted into norms for uniform meaning for test to test, that is for the purpose of comparison. A score is not high or low, good or bad in absolute sense; it is higher or lower, better or worse than other scores.
The norms calculated for the male and female students, reported in the manual are given in Table 6 and 7 respectively. Individuals scoring below 20th percentile were classified as 'Highly Adjusted', those between the 20th and 40th percentile were considered as 'Adjusted', 40th to 60th percentile represented 'Moderately Adjusted', 60th to 80th suggested 'Maladjusted', and those who scored the 80th percentile were treated as 'Highly Maladjusted'.

**TABLE - 6**

Norms Of Personality Adjustment For Male Students

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Extent of -Social-Emotional-Health-Home-Financial-Total Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Highly Adjusted</td>
</tr>
<tr>
<td></td>
<td>0-4 0-1 0-1 0-1 0-1 0-1 0-12</td>
</tr>
<tr>
<td>2.</td>
<td>Adjusted</td>
</tr>
<tr>
<td></td>
<td>5-7 2-4 2-3 2 2 13-18</td>
</tr>
<tr>
<td>3.</td>
<td>Moderately Adjusted</td>
</tr>
<tr>
<td></td>
<td>8-9 5-7 4-5 3 3 19-26</td>
</tr>
<tr>
<td>4.</td>
<td>Maladjusted</td>
</tr>
<tr>
<td></td>
<td>10-12 8-10 6-7 4-5 4-5 27-35</td>
</tr>
<tr>
<td>5.</td>
<td>Highly Maladjusted</td>
</tr>
<tr>
<td></td>
<td>13-20 11-20 8-20 6-10 6-10 36-90</td>
</tr>
</tbody>
</table>
TABLE - 7

Norms Of Personality Adjustment For Female Students

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Extent of Adjustments</th>
<th>-Social-Emotional-</th>
<th>-Health-Home-Financial-</th>
<th>-Total-</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Highly Adjusted</td>
<td>0-6</td>
<td>0-5</td>
<td>0-2</td>
</tr>
<tr>
<td>2.</td>
<td>Adjusted</td>
<td>7-9</td>
<td>6-7</td>
<td>3-4</td>
</tr>
<tr>
<td>3.</td>
<td>Moderately Adjusted</td>
<td>10-12</td>
<td>8-10</td>
<td>5-7</td>
</tr>
<tr>
<td>4.</td>
<td>Maladjusted</td>
<td>13-15</td>
<td>11-13</td>
<td>8-10</td>
</tr>
<tr>
<td>5.</td>
<td>Highly Maladjusted</td>
<td>16-20</td>
<td>14-20</td>
<td>11-20</td>
</tr>
</tbody>
</table>

1. Selection And Description Of The Scale

The Self Concept has been a concern of psychologists for a number of years. Despite this, the subject remains elusive and confusing, probably because of the lack of precision in defining this concept. There is really a dearth of an effective measurement technique in the absence of a really acceptable definition. No area of psychological research is currently more popular or more confused than that of having to do with the measurement of self concept. Moreover, it is not open to direct observation because it is an organisation within one's perceptual or phenomenal field.

Many psychologists claim that behaviour is best
understood as growing out of subject's frame of reference. According to them, behaviour should be interpreted according to the phenomenal field of the subject than be seen in terms of the analytical categories of the observation. In the latter technique the services of a trained observer are utilised, who makes a careful observation of a subject under a variety of circumstances and then infers the nature of the individual's way of perceiving himself and his world. But this technique is found to be dependent upon the sensitivity and skill of the observer. Thus, phenomenal approach to measure self concept is considered to be better than measuring it through 'observation technique' because behaviour can more accurately be inferred through this technique than the other. Thus, a self reporting technique was preferred over the other technique, in this study, in order to measure self concept (self acceptance) of the subjects.

For measuring self concept Indian tests such as Bhatnagar's Self Concept Inventory and Rastogi's Self Concept Inventory were examined. These inventories were available only in Hindi language. As most of the sample was drawn from A.M.U. where the number of Hindi knowing students is quite small, the tests available only in Hindi were not selected. Rating scale was preferred over inventory type of tests because it is less time consuming and at the same time interesting. Moreover, two inventories - Probs. Chec. and Pers. Adj. Inv.- were already included in the testing programme of the study.

Hence in the present study self concept is measured
through S.A. Scale constructed by Ansari, Department of Education, A.M.U. This scale was constructed on the basis of Q-Sort technique developed by Stephenson (1955). This technique was developed as a way of getting at various aspects of the self. Rather than constructing statements describing personal qualities or qualities cherished as an ideal, it contains a list of adjectives describing qualities of a person. In this scale the discrepancy between self and ideal self is used as a measure of self acceptance. From the definition of a self concept construct the concept of self acceptance is derived, referring, at least operationally, to the extent to which real self is congruent with the individual's description of his ideal self. In order to determine the degree of self acceptance of an individual taken as subject for investigation, a measure of discrepancy between perceived self and ideal self was used. This scale consists of Form I S.R. and Form II I.S.R. both containing a list of twenty similar adjectives describing the qualities of a person. In this scale, subjects were first exposed to Form I and were required to assign ranks 1 to 20 according to the qualities they find in themselves to the list of 20 adjectives. Again after an interval of sufficient time given to them to forget the order, they were again exposed to Form II and were required to rank the same qualities now as they would like most to be present in themselves.

2. Reliability

As reported, the reliability of the S.A. Scale was determined by means of split-half method. The
discrepancies between the ratings of self and ideal self on the list of 20 adjectives were separated into two sets of discrepancies on odd and even items and the two sets were correlated together, the coefficient of correlation being .77 when corrected by the Spearman Brown Formula, the reliability for the whole test was found to be .87. The reliability tested by the investigator of the present study by test-retest method was .71 (N=54) at an interval of one month.

3. Validity

The author says that it seems near impossible to validate this measure of S.A. against an external criterion as may be done with either type of tests. Insofar as the ranking of one's self perception and ideal self on these easy and comprehensible objectives or personality traits is concerned, if the individuals concerned understand clearly what they have to do, and do it seriously, the possibility is that the ranking would be true and valid. The author further elaborates that the validity of such measure would be ensured if they bear certain hypothesised relationships with other measures of personality. The validity of the scale has been demonstrated by the latter way by previous investigations (Qaisar Bano, 1956; Hameeda Hasan, 1967; Kaleem, 1970) in which S.A. scores obtained had shown considerably high relationships with Adjustment, security and insecurity, self disclosure, parental acceptance and peer acceptance.
(iii) THE L.A. CODING TEST

1. Selection And Description Of The Test

Level of aspiration has been referred to as a concept, as an attribute of a person and as a kind of response to various experiments. It is the standard a person hopes to reach in a given performance. It is the discrepancy between his achieved and his stated goals.

The early investigators studied the phenomenon under controlled conditions so as to understand its nature and situational determinants. Later L.A. was used as a technique to measure certain personality characteristics. In order to measure L.A. different tasks have been used. In any given task if the aspired level of performance is lower than the level of past performance, the goal discrepancy score will be negative, indicating that aspiration is lower than past performance. Though this procedure has been widely used in a number of experimental studies, only a few psychologists have developed it as a standardised tool for measuring individual differences in L.A. behaviour. Cassel (1950) and Rotter (1954) have devised and developed tests of L.A. Rotter developed L.A. Board. It is a performance test developed specially for clinical purposes. But most of the studies made with Rotter’s Board have shown low relationship between L.A. and personality characteristics. This may well be interpreted as indicative of the fact that the Rotter Board involves a task which is, in some way, so specific that cannot provide a generalised measure of L.A.
Moreover, being a performance test, it cannot be administered to a group of subjects at one time. Gassel devised a Paper and Pencil Group L.A. test which, like Rotter Board, follows the same procedure. But the task given in this test is utterly mechanical and is, therefore, uninteresting. Moreover, it is suspected that subjects are not sufficiently ego involved while taking the test and, as a result, they fail to reveal the aspects of their personality which are meaningfully associated with goal setting behaviour.

In view of the limitations inherent in Rotter's L.A. Board and Gassel's Paper-Pencil Group L.A. techniques, L.A. Coding Method for measuring L.A. was preferred. But L.A. God. Tes. constructed by Ansari and Ansari (1973) was selected for the present study because it is a standardised test which was evolved through actual life experiences and, as such, manifests itself as dimension of personality in relevance to life situations. Moreover, the instructions in the test are given in all the three major languages – Hindi, Urdu and English – of Northern India. This test is comprised of eleven parts, one on each page. The subject taking the test has to write letters for symbols according to the key which is provided at the top of the page. There is a time limit of 1 minute for each part of the test. The subject is required to indicate number of codes he expects to complete within the prescribed time in the space marked on the top of the page for this purpose and, at the signal of the tester, the subjects start substituting letters for symbols. After the time is over the subject is asked to stop his work and to write down the
the number of codes he has actually completed in the space provided for this purpose at the left bottom of the page. In this manner all the parts of the test are to be completed. The instructions were framed in simple words in three languages, namely, Hindi, English and Urdu. The time limit of 1 minute for each part was fixed.

2. Reliability

The reliability of the goal discrepancy scores was determined by both the split-half and test-retest method utilising the data obtained from different samples of subjects. The reliability coefficients were found to range from .74 to .93 by the split-half and from .72 to .80 by the test-retest method. The investigator of the present study also computed reliability by test-retest method. It was found to be .76 (N=50) at an interval of one month. It seems to be quite close to test-retest reliability computed by the authors of the test. Therefore, its reliability has further been verified.

3. Validity

The L.A. Cod. Tes. is logically valid because it is strictly consistent with the expected definition of the concept of L.A. The authors justify that the subject becomes familiar with the task by solving the example and completing the first part of the test, from the second part onwards, every time knowing his past performance in that task, explicitly sets a new goal to be achieved. Thus, the face validity of the discrepancy between the number of codes the
subject completes in the previous trial and the number of codes he expects to complete in the succeeding trials is beyond question. The test fulfils a number of external validation criteria as well. The test has not only successfully discriminated between academically successful and unsuccessful subjects, but has also proved to be good substitute, for a measure of L.A. in real life, showing that the test measures the phenomenon as a generalised and enduring dimension of personality (validity in terms of generality). Besides, it has successfully identified neurotics and psychotics (Kabir, 1964) and mentally ill (Ansari, Ansari and Rafiqunnisa, 1966) from normal subjects (status validity) and has shown relationship with such personality dimensions as are theoretically considered to be related to L.A. (construct validity), namely, security-insecurity (Ansari, 1966, Ansari and Zuberi, 1972), ego strength, rigidity (Ali, 1975) and self acceptance (Ansari and Zuberi, 1972).

(iv) IDEATIONAL TENDENCY SCALE

1. Selection And Description Of The Scale

In any activity, however big or small, humble or grand, creativity expresses itself. It has been seen that the mind in its finer state of development and intuition creates new things, thinks up new ideas that never existed before. A few creative minds can make an enormous difference to civilisation. Thus, creativity is considered to be a valued potentiality of all men and women. Torrance (1969) has rightly said that to prevent waste of human talent and to save gifted
students from becoming delinquents or leading a life of mediocrity, measurement and assessment of Gre. Pot. should be the first step towards the process of its actualisation and cultivation. Similarly, Toynbee (1964) viewed that if creativity is the type of talent which can make history through reshaping man's world, or if it is a matter of survival of a nation, it needs to be assessed.

Thus, measurement of creativity will be a positive move towards better and greater understanding of an individual and would also provide an adequate basis for accurately predicting something about his future.

Drevedahal (1956) enumerated three general approaches to the study of creativity, the historical anecdoted approach, the introspective personal report approach and the test approach. Efforts to prepare tools for assessing 'Creative Thinking' abilities continued in one form or the other since Dearborn first attempted in 1898 to study the imaginative responses of Harvard students to a series of ink blots. A number of different tests were developed between 1898 and the efforts of Guilford in fifties to develop instruments for the measurement of divergent thinking abilities. The sporadic efforts were continued till thirties and forties when Guilford carried this work on a systematic and large scale in his factor analytic studies of various thinking abilities including creativity.
Guilford and his associates who worked on the structure of intellect (1950) and have been doing basic research work in creativity for nearly three decades have brought to the fore the existence of two distinct types of thinking abilities, namely, convergent and divergent thinking abilities. In convergent thinking, according to them, ideas and facts generate from known information whereas divergent thinking pertains to new ideas and data which depend little on known data. According to Guilford creative thinking is essentially an expression of divergent thinking abilities, and most relevant divergent thinking abilities are fluency, flexibility, originality, elaboration, sensitivity to problem, and the ability to analyse, synthesize and redefine material. Originally Guilford included only divergent thinking abilities i.e., fluency, flexibility, originality and elaboration. But he, in his later writings, redesignated the components of creative thinking and incorporated within its field not only divergent production abilities, but also redefinition abilities of the convergent production category and sensitivity to a problem.

The formation of the tests, which are used for the present study, is based on the following dimensions of creativity: (1) Imagination (2) Sensitivity (3) Originality and (4) Spontaneity. However, the test battery is constructed in such a way that by slightly modifying the scoring system the divergent thinking abilities, as defined by Guilford, can
also be measured with equal ease and appropriateness. For the present study it is the modified system of scoring that have been used and scored the responses of the subjects for fluency, flexibility, originality and elaboration as the basic divergent thinking abilities according to Guilford's formulation. Therefore, through measuring these divergent thinking abilities a basic idea of various dimensions of creativity can be formed because these divergent abilities also have predictive value. Thus, it serves as an indicator of creative potentiality. This line of approach to predict creativity through measuring divergent thinking abilities has also been endorsed by Getzels who contended that students with superior divergent intellectual ability may, in the long run, prove to be more creative.

Thus, the battery measuring divergent thinking abilities, namely, fluency, flexibility, originality and elaboration is considered to be validated test for discriminating Cre. Pot. in individuals. Even Torrance Battery of creative thinking measures only these four abilities. These four dimensions of divergent thinking abilities may be described as follows:

(1) Fluency

It represents the subjects' ability to generate ideas and concepts on the basis of a single stimulus. It refers to the quantity produced in a specified time.
(2) **Flexibility**

It denotes a measure of the diversity that pervades the subjects' ideas. It is the capacity to adjust readily to new situations. Flexibility in thinking means a change of some kind, a change in meaning, interpretation, or use of some thing, a change in strategy of doing the task or a change in direction of thinking which may be summed up as new interpretation of goal.

(3) **Originality**

It is the capacity to produce unusual or uncommon ideas, solve problems in an unusual way and use situations or things in an unusual manner. It means the production of unusual, far fetched and clever response. One must get away from the obvious, the ordinary or the conventional. Originality is specified statistically in terms of incidence of occurrence. It characterises the truly divergent behaviour of an individual with Cre. Pot. Hence originality measures indicate the strength of the mental leaps and the rarity of departure from common place.

(4) **Elaboration**

It is the ability to complete a plan or making meaningful objects out of meaningless objects. It is an ability to elaborate a problem or fill in details.

The creativity tests have been criticised from
time to time. They have been observed to suffer from some shortcomings from theoretical as well as methodical point of view. Barron (1969) objects to their use. He contends that subjects are superficially engaged in artificial creative task. The short and time tests strike at the essence of creative process which goes at its own pace. It gets easily aborted if some one is blowing a whistle. Moreover, they measure creative ability in fragments which provide no opportunity for integral quality of intellect to manifest itself. Although the situation is not as grave as Barron put but this much is true that in actual creativity, the task is spontaneous and essentially coherent and unified whereas in creativity tests it has to be of necessity a task broken into small measurable units and it cannot be spontaneous because the responses are given on predefined stimuli. All the same if we want to predict creativity it is inevitable to use creativity tests. Only caution is to be taken to select those tests which are least abstract, most comprehensive and present situations that are as close to real creativity as possible. Contrary to the views held by Barron and others who criticised creativity tests, Guilford assumed that studying creativity without preparation, incubation, insight or motivation amounts to studying creativity with some elements present. In short time when a subject produces responses at high rate, he comes in touch with his subconscious-ness where creative action occurs. Once a subject starts with a test, he hardly gets any time to think over his responses. Thus, he produces responses without evaluation. Therefore, all
types of ideas get an opportunity to have their way to the conscious region. Moreover, the utility of these tests as a tool to identify Cre. Pot. cannot be doubted. Even Taylor and Holland (1964) accept their value to the extent of using them as preliminary and investigatory type tests to identify potentially creatives. Thus, the predictive value of these tests is accepted because through test scores creative potentiality of people is estimated and predictions about future performance are made based upon creative potential. Hence these tests are considered to be useful in identifying talents which may otherwise go waste.

In the present study the creativity battery prepared by Zaidi, Deptt. of Education, A.M.U., has been used. This battery is constructed in Urdu, Hindi and English languages and is suitable to Indian conditions because the stimulus words and names of the things included in this battery are commonly used in day to day life in India. Moreover, this is the only battery which has been constructed in all the three main languages of Northern India. Therefore, the investigator selected this battery so that each subject could express himself/herself in the language on which he/she had a good command because in a creative test it is essential that subjects should think as well as express in the same language. This battery was preferred over creative thinking tests prepared by Baquer Mehadi, and Passi Test of Creativity because these tests are neither constructed in all the three languages as
mentioned above nor are they as comprehensive as this battery is. Moreover, this battery of tests is not translations of the tests on which they are based but adaptations wherein ethos and temperament of each language are taken into account while transcribing the tests into three languages. Most of these tests are prototype of Guilford's tests but they are original in content and form.

Ide. Ten. Sca. used in the present study measures all the four dimensions of divergent thinking i.e., fluency, flexibility, originality and elaboration. It consists of six tests, namely, Similarities Test, Uses Test, Word Association Test, Word Fluency Test, Number Association Test and Circle Elaboration Test. Each test contains 4 to 6 items but the last test contains 12 circles of different sizes.

(a) **Similarities Test**

This test is developed on the pattern of Similarities Test used by Wallach and Kogan (1965) in studying modes of thinking in young children. But Similarities Test used in this study differs from the test developed by Wallach and Kogan in many ways. First, the items given in the tests are different; Secondly, Wallach and Kogan's test is specifically designed for administering on each child individually and orally whereas the items of this test are suitable for both adolescents and adults. Moreover, it can be administered individually or in a group wherein the testees are required to write down as many similarities between a pair
of objects as they can.

This test purports to cognise various similarities between two specified objects which require cognition of multiple analogy between two objects. It is hypothesised that the production of numerous and unique class characteristics is the function of ideational fluency and originality. This test consists of four pairs of objects which have common characteristics in them. The instructions given in the test are to write down as many common characteristics as the subject can think of. In order to clarify the directions an illustration demonstrates the common characteristics of 'apple and orange'. Eight similarities between the two objects are given in the example such as both are round, are fruits, have seeds, have beautiful colours, are nourishing etc.

(b) Uses Test

This test is developed on the pattern of Guilford's Utility Test used in his battery of tests of creative thinking. But the Uses Test differs from the Utility Test designed by Guilford. The item 'brick' is only borrowed from Guilford's Utility Test. Moreover, Guilford's test has fixed time limit whereas in Uses Test the time limit given is not to be followed strictly. The testees are required to complete the test as early as possible.

This test aims at measuring ideational fluency, spontaneous flexibility and originality and measures the
ability to use physical environment in a variety of ways. It is represented by common objects of daily use which can be used in different ways if the subjects apply their power of imagination in thinking out various uses of the objects. The subjects were asked to write as many uses of each of the six objects separately as they can. They were further asked to write their uses, however, strange they may be. Thirteen illustrations of the uses of 'Pencil' such as 'to sketch', 'to mark', 'to measure shadow', 'as book mark', 'as peg', 'to save insect from drowning', 'to produce sound' etc. make the directions clear.

(c) Word Association Test

This test is developed on the pattern of 'Word Association Test' used by Getzels and Jackson (1962) in their study of Creativity and Intelligence: Explorations with gifted students. In the 'Word Association Test' constructed by Getzels and Jackson, twenty five words such as Arm, Cap, Duck, Fair, Pitch, Sack, Tender, Pink, Leaf etc. were included which are either nouns or adjectives. Whereas the 'Word Association Test' used in the present study consists of only four words which are either nouns or verbs. In addition to that, this test is shorter in comparison to the other. Moreover, the words included in this test are totally different from the words included in the other test and meanings are to be given in phrases and not in words.

This test aims at measuring fluency and flexibility
through symbolic content by producing various shades of frame of reference and to shift the frames within organised structure. The subjects were asked to write down as many meanings of each word as they can. They were further asked to write meanings in phrases. Ten meanings of the word 'cut' such as to make pieces, to separate, to divide, to pass time, to cancel and to check etc. were given in the instructions to clarify the directions.

(d) **Number Association Test**

This test was designed on the pattern of 'Word Association Test' used by Guilford but the numbers chosen for this test are different from the numbers given in Guilford's test. This test aimed at measuring fluency and flexibility through numerical words. The subjects were instructed to make as many compound words or idioms related to the given number as they can. Ten illustrations of number Five such as Five Year Plan, Basant Panchami, Five Times, Five Colours etc. were given to clarify the direction.

(e) **Word Fluency Test**

The Word fluency test is developed on the pattern of Guilford's word fluency test constructed for this battery of tests on creative thinking. This test aims at measuring the ability of subjects to produce as many words as they can think of by motivating them to generate words, as letter pattern, from memory storage. This test is divided into two parts A and B consisting of two letters in each part. The subjects were asked to generate words starting with the letters
given in Part A whereas they were asked to make words ending with the given letters in Part B. Three illustrations of letter P were given in Part A and similarly three illustrations of letter M were given in Part B.

(f) Circle Elaboration Test

This test measures figural imagination - the ability to perceive circle in a variety of situations as a part of bigger entity or an outline of the whole unit. This test is developed on the pattern of Torrance Circle Elaboration Test constructed for his Battery of Creative Thinking (1966). But it is a revised and improved version of Torrance's Circle Elaboration Test which consists of 42 small circles of equal size and the time limit given is 10 minutes only. Moreover, in Torrance's test verbal hints such as Wheel, Tyre etc. are given in the test and in addition to that the tester is required to draw examples on black-board showing how these objects could be sketched by adding lines inside or outside or both inside and outside the circle. In contrast, the test used in this study consists of 12 circles of two different sizes which are randomly placed in different cells. The circles of two different sizes were selected to provide better stimulus for placing more premium on the figural spontaneous flexibility than on ideational fluency but in the circle of same size the testees manifest the ideational fluency more than any other ability. Therefore, the circles of different sizes direct examinees' thinking to refer to different contexts. The time limit of eight minutes for
drawing 12 circles was not strictly followed and similarly illustrations either verbally or through sketching were not given so as to leave the subjects' imagination free because it is a figural test and, therefore, it was not considered necessary to provide figural illustrations.

This test consists of circles of two different sizes with a diameter of 3.5 and 1.8 cms respectively. The subjects were asked to make meaningful objects/figures out of these circles. They were also asked to elaborate upon the figures in any way they like. Instructions were provided in the beginning of the test so as to give directions to the thinking of the subjects and motivate them to produce meaningful pictures. This test aims at measuring fluency, flexibility, originality and elaboration.

(2) Reliability

The reliability of the Ide. Ten. Sca. was computed by the investigator herself on a sample of 800 students. The reliability coefficient of the test was calculated by Split-half (odd-even) method corrected by Spearman-Brown Formula on the basis of random sample of 200 scripts from a group of 800 students. Every fourth script was drawn from the total sample arranged serialwise. The reliability coefficient works out to be .94. It corresponds to a standard error of 3.60 points for an individual's creativity score. It is reasonably

\[ S.E. = \frac{SD}{\sqrt{1-r_{ll}}} \]

where SD=15, the SD of the creativity score and r_{ll} = the reliability coefficient.
high. Moreover, the investigator computed test-retest reliability at an interval of one month which came out to be .66; N=53, which appears to be quite high for a creativity test.

(3) Validity

In dealing with creativity, the most reliable criterion would be the creative product itself. Since the purpose of the present study is to assess the Cre. Pot. of the testees and not their creative performance in any specific field, say, as a creative writer of repute or a creative artist or a creative scientist etc., the purpose of using creativity battery was to find out whether an individual has Cre. Pot. or not. The test battery used in this study has been validated in the following ways:

(a) Face Validity

A measure is said to have a face validity to the extent that the items which it contains are related logically or reasonably to the construct which the test is supposed to be measuring.

Ide. Ten. Sca. is found to be logically valid because it is consistent with the expected definition of the concept of divergent thinking abilities as formulated by Guilford as a measure of identifying Cre. Pot. Moreover, all the six tests of this battery have been based on the format of the tests of creativity constructed and used by Guilford, Kogan and Wallach, Getzels and Jackson and Torrance whose validity have already
been established. The items of these tests suited the criteria that were to be tested. Several considerations suited to creativity influenced the kind of tests constructed and the items selected in each test and which are given as under:

(1) All the tests constructed for the purpose of the present study are purported to measure the divergent thinking abilities, as all the situations of the tests require many possible correct responses which is a typical requirement of divergent thinking.

(2) All the items are such in which something must be created by the testees depending on the stimulus situations.

(3) The situations and tasks are open ended to maximise divergent responses and to give free reign to the subjects' imagination. This device is expected to help distinguish between the potentially more or less creative subjects.

(4) All the tests present simplified tasks to be performed. Simplification of tasks is essential to achieve maximum possible objectivity in scoring and judgement.

(5) Simple tasks and situations are used to maximise variance due to difference in personal experiences.

(6) More than one score from each test is derived in order to assure that they have sufficiently unique variance to justify their use. For this purpose more than one criteria of judgement are employed for scoring responses on each test so that finer shades of difference in quality of response could be obtained. The items selected are related to
day to day experience and not to any particular field so that the responses discriminate between potentially creative persons in different areas - (art, science and literature etc.) - and not in any particular field only.

(b) **Construct Validity**

In order to find out the extent to which the creativity battery, as a whole structure, stands consistent within itself, inter-correlations among different abilities of divergent thinking such as fluency, flexibility, originality and elaboration were determined.

The construct validity of this battery was determined by Zaidi and Mazhar (1976-77). They calculated the inter-correlations between different divergent thinking abilities i.e., fluency, flexibility, originality and elaboration of all the items included in this battery which are given as under:

<table>
<thead>
<tr>
<th>Variables</th>
<th>Flu.</th>
<th>Flex.</th>
<th>Orig.</th>
<th>Elab.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flu.</td>
<td>-</td>
<td>0.57</td>
<td>0.76</td>
<td>0.69</td>
</tr>
<tr>
<td>Flex.</td>
<td>0.57</td>
<td>-</td>
<td>0.59</td>
<td>0.60</td>
</tr>
<tr>
<td>Orig.</td>
<td>0.76</td>
<td>0.59</td>
<td>-</td>
<td>0.29</td>
</tr>
<tr>
<td>Elab.</td>
<td>0.69</td>
<td>0.60</td>
<td>0.29</td>
<td>-</td>
</tr>
</tbody>
</table>

Out of a total of 12 inter-correlations obtained $r$ values range between .29 to .76. All correlations are positive and significant.
(c) Concurrent Validity

One of the methods of finding concurrent validity of a test is to validate it against an external criterion.

The concurrent validity of the battery used has been established by validating it against some external criteria. Zaidi and Shama (1976-77) found significant and positive correlation between the scores of self awareness test and this battery. The calculated value came to be .22 which is low but significant at .01 level. Though the correlation is low because creativity and self awareness are the variables of two different areas yet it is psychologically significant. Similarly, the investigator herself found a positive and significant correlation of .39 between the scores on self acceptance test and this battery of creativity which is positive and significant at .01 level.

(d) Concept Validity

The purpose of the test battery used in this study is to assess divergent ability (general creative ability). The fourth and the most important form of finding validity of the battery would be an attempt to judge its concept validity.

It is an objective truth and common observation that most of the gifted students are drawn towards Medical and Engineering professional courses. Therefore, Medical and Engineering students are expected to have more creative potential than the
students of Law and Teaching. Assuming that students are
drawn, as well as selected, towards professional courses accor­
ding to their natural talent and given potential, Medical
and Engg. students are expected to be more creative on this
test battery than Law and Teaching. Thus, a comparative study
of the number of creative students and amount of the scores
obtained by the students of these professions would be sufficient
for this purpose. Therefore, comparison would be made by means
of examining creativity scores as well as the number of H.Cre.
and L. Cre. in each profession on this test battery on the
following points:

(1) The higher the creative scores of Medical
and Engg. students, the more conceptually valid the test will be.

(2) The lower the creative scores of Law and
Teaching students, the more conceptually valid the test will be.

(3) The greater the number of H. Cre. and lower
the number of L. Cre. in Medical and Engg. group, the more
conceptually valid the test will be.

(4) The lower the number of H. Cre. and the
higher the number of L. Cre. in Law and Teaching courses, the
more conceptually valid the test will be.

Such a comparison is made on the percentages and
mean scores given in Tables No. 37 and 38 respectively which
indicates that the number of H. Cre. is highest in Medical and
lowest in Law. Similarly, highest mean scores on creativity
fall in Medical group, Engg. students stand second, Teaching
third and Law the fourth. Thus, this result is a solid evidence of the concept validity of this test battery so far as the present study is concerned.

(ii) ADMINISTRATION OF THE TOOLS

After the selection of the sample and the required tools, the investigator personally went to the institutions for the administration of the tests. The actual administration was preceded by a brief talk with the Principal/Head of each of the institutions/Deptts. with a view to explain the purpose of the investigation and thus to enlist his/her cooperation.

The Prob. Ghee, and all the four personality tests were administered in the normal class periods with the help of the teacher concerned. These tests were administered on two consecutive days. L.A. Cod. Tes., S.A. Sca. and Sts.Prob. Chec. were administered on the first day and Ide. Ten. Sca. and Pers. Adj. Inv. on the second day.

Test administration is one of the most important steps in the process of any psychological research. In the absence of correct administration of the tests one cannot hope to get valid results. In order to elicit right response and seek willing cooperation of the testees, the purpose of the study and the utility for the subjects to participate in the testing programme should be explained to them. Cronbach (1960) stresses,
"Unless the subjects are given a personal reason for taking the test, research employing tests have little meaning for testees."

Thus, anticipating the inquisitiveness of the testees, a brief preliminary talk was given to them to kindle their interest and to motivate them. The talk was focussed on the following points:

(a) The main purpose of the test work was research but the results of all the inventories and psychological tests would be sent to the Principals/Heads of the institutions to communicate the results to the testees.

(b) These inventories and psychological tests would give the testees some practice which might be useful for appearing in any entrance test or selection test wherein they may have to undergo testing procedure.

(c) The testees were asked to do these tests in the spirit of play and fun. It would not only be enjoyable doing these tests but would also help them to get a great deal of self insight.

The investigator was called upon to answer volley of questions of different types thrashed out by the testees. All the queries made were properly answered. The investigator was fully conscious of the fact that flexibility in approach is required in conducting the tests and other programmes even though standardised instructions may remain the same, their stimulus value may not be the same for each individual. After the tests were over some of the testees expressed their desire
to discuss their personal Probs. with the investigator and seek her advice. They were asked to contact her later to discuss. Some of them did turn up later and discussed their Probs. and it was subsequently found that they had marked large number of Probs. in the Checklist and their personality make up was also found to be unsatisfactory. This shows that the investigator was successful in establishing rapport with the testees by winning over their confidence and sharing their Probs. Moreover, their reactions indicated that most of the testees furnished honest and correct information gathered through different inventories and tests.

Each test was administered in accordance with the instructions laid down in their respective manuals after emphasising on the personal value of the tests for the testees. The instructions given in each test were explained in a simplified manner and directions given were read out carefully and slowly. The difficulties felt by the testees were solved before they were asked to work on the test. Thus, reading of instructions and question period was not hurried. The investigator made her best efforts to see that each testee had clearly understood what he was to do before starting on the test. They were asked to complete carefully the initial entries to be filled in each test. Time given in the timed test was strictly observed by watch and a stop watch was used in conducting L.A. Cod. Tes. wherein only one minute was allotted for completing one part of the test. In Ide. Ten. Sca.
time limit of eight minutes was allotted to complete each test and the testees were asked to try to complete all the six tests of the battery in 50 minutes. As from the wordings of the instructions it appears that the author does not intend that the time limit given be strictly followed, therefore, time limit given in completing creativity battery Ide. Ten. Sca. was not strictly followed. In creativity tests an appropriate assessment context will require freedom from any temporal pressure. Moreover, it has been found (Vernon, 1971) that performance on divergent thinking test is affected by the conditions of testing, the way the instructions are phrased, and the frame of mind of the testees. Therefore, the testees were made to feel that they were doing it for fun and not as a test or an examination. No time limit was observed in Sts. Prob. Chec., Pers. Adj. Inv. and S.A. Sca. but the testees were asked to complete these inventories by furnishing required information about themselves freely, frankly without any hesitation and as quickly as possible. Precautions were taken so that the testees did not talk among themselves or copy from each other. They were made to sit not so close as to have the temptation to talk or to copy.

(iii) **SCORING OF THE TESTS**

(a) **Scoring Of The Sts. Prob. Chec.**

The scoring of the checklist is very very simple. There are no right or wrong answers to the statements
because the students have to identify their problems they face and to tick them. An individual's score is the number of statements or Probs. he has marked. The investigator has quantified the Probs. by giving one score to each Prob. marked simply (✓) by the students in each area and by giving two scores to each Prob. doubly ticked (✓✓). While scoring the checklist frequency of Probs. in each area, as well as in total, was worked out for each individual.

(b) Scoring Of Pers. Adj. Inv.

The booklets of this inventory were scored with the help of a set of punched keys, prepared for both Hindi and Urdu forms. Scoring with the help of keys was simple. On every key for an area, holes were punched for 'yes' or 'no' responses at the top and at the bottom. The page number of the forms was inscribed above those holes. The scorer had to adjust on each page the key for a particular area, count the tick marks through the holes and assign 1 mark to each tick (✓) visible through the hole.

**AREAS**

A. Social - 1, 9, 11, 16, 22, 25, 29, 35, 41, 44, 48, 54, 57, 60, 64, 68, 73, 78, 85, 89.

B. Emotional - 2, 7, 12, 17, 26, 30, 34, 38, 45, 47, 50, 56, 61, 67, 69, 75, 81, 82, 86.

C. Health - 1, 8, 13, 15, 20, 24, 31, 33, 37, 42, 49, 53, 55, 59, 66, 70, 74, 80, 88, 90.

D. Home - 4, 6, 10, 14, 19, 27, 32, 40, 43, 46, 52, 58, 62, 65, 72, 76, 79, 83, 87.

E. Financial - 5, 18, 23, 28, 39, 51, 63, 71, 77, 84.
The higher the score, the more maladjusted is the individual. Thus, a student getting 59 scores is more maladjusted than the one who gets 45 scores on this inventory but the third who gets 6 scores is well adjusted.

(c) Scoring Of The S.A. Sca.

The ranks given in each form from 1 to 20 were converted into ratings on a five point scale using the forced Q-sort technique. The adjective rank 1 was given to a rating of 1, the next two ranks 2, 3 were assigned a rating of 2, ranks 4, 5, 6 and 7 were assigned a rating of 3, ranks 8, 9, 10, 11, 12 and 13 were given a rating of 4, ranks 14, 15, 16 and 17 a rating of 5, ranks 18, 19 a rating of 6 and ranks 20 was assigned a rating of 7.

The self-ideal self discrepancy was computed by finding the difference of the rating of each of the twenty items, thus, obtained in relation to self and ideal self. On the twenty adjectives the total discrepancy score of the individual was obtained. It served as the measure of S.A. Thus, higher discrepancy between the ranking of self and ideal self was represented by a high score and low discrepancy by a low score and, therefore, higher score meant low degree of S.A. and low score, a high degree of S.A.

(d) Scoring Of The L.A. Tes.

The scores of the subjects were obtained by subtracting the number of codes the subjects had completed
in the previous part from the number of codes he expected
to complete in the subsequent part. The number of codes
expected in the very first part and the number of codes
completed in the last, that is, eleventh part being ignored
as there was no previous performance on the task in the case
of the former and no future goal setting in the case of the
latter.

The subjects, thus, obtained ten discrepancy scores
and the average of these scores was known as goal discrepancy
(G.D.) score as the main index of the subjects level of
aspiration. Thus, a student who gets 35 scores on total of
ten discrepancy scores will get 3.5 goal discrepancy score
(G.D.) by averaging these scores.

Goal discrepancy scores may be scored either with
or without an algebraic sign. A high discrepancy score without
an algebraic sign indicates the difference between the level
of performance actually attained regardless of whether the
level aspired exceeds the level attained or vice versa.
Thus, it is a measure of reality irreality dimension of L.A.
Therefore, 3.5 G.D. score is a measure of reality irreality
dimension of L.A. of that particular student. A goal discrepancy
score with an algebraic sign, on the other hand, indicates the
direction as well as the degree of the deviation of the level
aspired from the level attained, that is, the extent to which
aspiration in each successive part is raised or lowered in
comparison with the performance in the previous part.
Therefore, when a person lowers his estimation in future performance than his past performance, he gets negative score i.e., when he has completed 41 codes in the first part but estimates 30 codes in the second part, his G.D. score without algebraic sign will be 11 but with an algebraic sign it will be -11. Thus, a student who gets 3.5 G.D. score ignoring algebraic signs may get -4 G.D. score (negative score) or +4 G.D. score (positive score) when algebraic signs (- +) are considered by subtracting all negative and adding all positive scores on all the ten parts (excluding the number of codes expected in the first part and the number of codes completed in the eleventh part). Thus, system of scoring with an algebraic sign results in different degrees of positive and negative goal discrepancy scores.

(e) Scoring Of Ide. Ten. Sca.

In the present study 4 tests out of 6 subtests of the battery had been used for the research purpose. 'Word Association Test' and 'Word Fluency Test' have not been used because other four tests were considered to be sufficient to give the investigator a fair idea of the subjects' Cre. Pot. through measuring fluency, flexibility, originality and elaboration. Since creativity was one of the five variables of the present study, getting only the basic idea of the Cre. Pot. was considered sufficient.

(i) CRITERIA OF JUDGEMENT AND SCORING SYSTEM

All the items of the tests provide open
ended answers. It means that the subjects can give as many responses as they can think of. In Similarities Test all the four items were scored for fluency and originality, in Uses Test items were scored for fluency, flexibility and originality. All the four numbers in Number Association Test were scored for fluency and flexibility but in Circle Elaboration Test figures or diagrams drawn in each circle were scored for fluency, flexibility and originality.

(a) CRITERIA OF JUDGEMENT

The following criteria of judgement was taken into consideration:

(1) Fluency in responses was determined by counting the number of appropriate and related responses given by the subjects. The criterion of appropriateness demands that the subjects write the same type of responses which are expected from them on the basis of the instructions given in the test. For instance in the Uses Test they are expected to give the uses of a particular test item instead of giving its description or importance etc. The criterion of relatedness means that the responses should be related to the stimulus item. For example, in the Uses Test if subjects have given the uses of 'brick' they should appear to be related to brick and not to any other object. Any response credited for fluency should fulfil these two criteria. If a response is related but not appropriate or vice versa it should not be given any credit.

(2) Flexibility in responses was determined
by counting the number of categories to which responses belong.

(3) Originality in responses was determined on a continuum of appropriateness, cleverness and uncommonness - a statistical infrequency of responses.

(4) Elaboration in responses was determined by counting the number of details added to a figure, a diagram or a picture.

(b) SCORING SYSTEM

(i) Criteria

1. One fluency score was assigned to an appropriate and related response. The total number of appropriate as well as related responses of the whole test determined the total fluency scores.

2. For flexibility the number of different categories of responses or shifts in categories of responses were counted and one score was assigned to each category or shift.

3. Originality scores were given on the basis of appropriate, clever and uncommon responses. The highest scores were given to the least common responses. The tallies were marked to find out relative infrequency of different categories of responses. The uncommon and clever answers were tallied and originality scores were given on the basis of statistical uncommonness.

4. Elaboration scores were assigned for furnishing details or distinctness to a picture, diagram etc. One score to a maximum of 3 scores were assigned for giving
to each figure or diagram. Elaboration was also judged on the basis of aesthetic sense of the students.

(ii) SCORING OF THE TESTS

1. Scoring For Fluency

In order to measure fluency each appropriate and related response was assigned the credit of one score in each stimulus e.g. in the Similarities Test responses for 'Man and Plant' such as both need food, water, air, both have reproductive system, both decay, liable to disease etc. were scored because these responses were appropriate and related. All of these responses were assigned scores for fluency.

2. Scoring For Flexibility

Flexibility scores were determined by a person's ability to produce ideas which differed in approach or thought trend. For measuring flexibility each shifting of categories of the ideas was assigned 1 score for flexibility. In the Uses Test the different categories of the uses given for newspaper were for making bags, for fire, for reading, for wrapping things, used as weapon etc. Thus each category was separately scored. On the other hand, the responses that newspaper is used for making bags, toys, envelopes, pictures were not scored separately as they belonged to the same category of making things.

3. Scoring For Originality

Statistical uncommonness was the final
criterion for scoring for originality. Hence 'Statistical uncommonness' was considered in measuring originality. The responses of each subject were examined in the context of the whole group and graded scores were allotted. The novel and infrequent responses which occurred between 1-5 were given 5 credits, responses which frequented between 6-10 were assigned 4 credits, between 11-15, 3 credits, between 16-20, 2 scores and between 21-25 were assigned 1 score only. Even for clever answers if they frequented more than 25 responses no credit was given for originality.

4. Scoring For Elaboration

The scoring system for elaboration is different from the scoring for other dimensions. In scoring for elaboration credit was given for each relevant detail for a figure or a diagram or a picture up to a maximum of 3 scores in each case. However, the basic response itself must be meaningful. For example, if a sketch of human face was drawn and many other things like spectacles, ear rings, hat etc. were added to it, then for each elaboration a credit of 1 score was given up to the maximum of 3 scores in each case.

C. DATA PROCESSING

For the purpose of statistical analysis of the data the following procedures were adopted:

(1) The raw scores of the students of Medical, Law, Engineering and Education on Prob. Chec., Pers. Adj. Inv., S.A. Sca. and L.A. Cod. Tes. with or without signs were
tabulated separately professionwise, as well as of the total sample, into frequency distributions and means and standard deviations were calculated.

(2) The total scores for fluency, flexibility, originality and elaboration were converted into standard scores. Then a composite creativity score was obtained for each student by adding their standard scores. A total creativity score of each student was obtained by converting the composite standard scores on a scale of mean 100 and SD 10. Then means and SD's of the total creativity standard scores were computed separately professionwise as well as of the total sample.

(3) In order to make comparative study of the Probs., Pers. Adj., S.A., L.A. and Cre. Pot. of the students of different professions, the mean value of each variable was compared among different professions. In order to establish further whether obtained mean differences were statistically significant or not their 't' values were calculated. To test the significance of 't' value the following levels of confidence were established:

(a) Not significant at the .05 level if the 't' value was 1.95 or less.

(b) Significant at .05 level if the 't' value was between 1.96 and 2.57.

(c) Significant at the .01 level or highly significant when the 't' value was 2.58 or large.

(4) In order to form High and Low groups on
all the five variables in each profession, all cases obtaining scores one standard deviation above the mean were included in the high groups and conversely all the cases scoring one standard deviation below the mean comprised low groups. Thus, High and Low groups on all the variables were identified by using cut off points at one standard deviation of the total scores on each variable in each profession.

(5) The High and Low groups on Sts. Probs., Pers. Adj., S.A., L.A. (with and without signs) and Cre. Pot. were compared separately among different professions and their significance was tested by 't' test so as to make micro analysis of the differences obtained in different variables among different professional groups. The High and Low groups of different variables in each profession were compared in the following ways:

(a) Differences in the mean scores on Pers. Adj., S.A., L.A. (with and without signs) and Cre. Pot. between H.P. and L.P. groups were calculated and their significance of differences was tested with the help of 't' test professionwise and of the total. The purpose of the comparison was to know how far the students having H.P. differ in each of the personality variables included in this study from the students having L.P.

(b) In order to determine how far H.A. and L.A. students in each profession and in the total sample differ in the Probs. they face, the mean Probs. of High and
Low groups on Pers. Adj. were compared and their differences were statistically tested.

(c) Similarly, differences in the mean scores on the Probs. between H.As. and L.As. groups in each profession and of the total sample were tested by the 't' test in order to find out whether high and low groups on L.A. significantly differ in their Probs. or not.

(d) Differences in the mean scores on Probs. between H.Cre. and L.Cre. students of all the four professions and of the total sample were judged and the significance of their differences was tested in order to find out which of the two groups of H. and L. Cre. had significantly more Probs.

(6) Differences in the mean scores of Probs. on ten problem areas were tested between different professions and of the total sample by applying 't' test so as to determine the significance of difference among different areas of problems in each of the four professions and the whole sample.

(7) Chi-square as a test of significance was applied to differentiate distributions of Probs. in different professional groups. This test was applied to find out whether Probs. were equally distributed among different professions or not.

(8) In order to determine whether different types of Probs. are independent of different professional groups, Chi-square test was applied to analyse the Probs.
so as to test their independence with regard to different professional groups.

(9) In order to find out the degree of relationship between Probs. and each of the four personality variables, correlations between Probs. and each of the four personality variables were computed by Pearson's Product moment formula.

(10) Inter-correlations among different personality variables were calculated so as to determine whether different personality variables were significantly related to one another or not.

(11) In order to compare the Personality profiles of the highest and the lowest achievers on the Probs. variable in each of the four professions their raw scores on each personality test were converted into Z-scores and comparisons were made.
REFERENCES


