(4-1) Design of the study: The present investigation was designed to study the Effects of Anxiety (Trait and State) Psychological Stress and Intelligence on laboratory learning and real life learning (academic achievement).

A factorial design was used which consisted of two levels of each of the main effects: high- and low-anxiety as measured by Hindi Version of STAI (Spielberger, Sharma and Singh, 1973), high- and low-intelligence as measured by Hindi version of General Mental Ability Test (GMAT) developed by Hundal, (1962), experimental conditions of stress and control, induced through verbal ego threatening and neutral instructions, respectively and five stages/blocks of learning. Factorial design \( AB \times CD \times 2 \times 2 \times 5 \) was employed, where \( A \) stands for stages; \( B \) for anxiety; \( C \) for intelligence; and, \( D \) for stress. This design was an extension from type III design given in Lindquist (1956, pp.281-284). This type of design is particularly useful in experiments involving comparisons of learning curves or of trends in training, since it permits the use of matched groups in such studies.

The same analyses were replicated for A-state scores. A-State measures were taken after the completion of each task, to measure the effect of stress on different combinations of anxiety and intelligence.

Since the rpb between A-State scores, obtained after serial verbal learning task, and stress was .60, which is highly significant and rpb between A-State scores, obtained after paired-associate learning, and stress was .65, the variable of stress
in A-State analyses was achieved. It is of no use to consider two highly correlated variables as independent. Hence, the experimental design was reduced to \( A \times B \times C \), i.e., \( 2 \times 2 \times 5 \); \( A \) representing five stages (each stage of five trials), \( B \) two levels of anxiety (HA and LA) (A-State), \( C \) two levels of intelligence (HI and LI).

An experimental design of \( 2 \times 2 \times 2 \) two levels of intelligence (HI and LI) and two levels of trait anxiety (HA and LA) was applied to achievement data.

Dependent variable in the study was number of correct-responses on learning tasks. Two types of learning tasks, serial verbal learning (nonsense syllables) and paired-associate learning (meaningful words) were taken. As has been reported earlier the effects of anxiety are different for tasks varying in difficulty levels, it was decided to control the factor of task difficulty by developing the learning tasks with moderate difficulty level. Further stages of learning were considered to be an important variable. There is empirical evidence that anxiety influences learning differentially at different stages of learning. Therefore, serial and paired-associate learning tasks were divided into five stages/blocks of learning. Each block consisted of five trials. Criteria for learning were kept to two successive errorless trials or maximum of twenty-five trials.

It's assumed that difficulty of school examination is of moderate level, so that students at every intelligence level are able to achieve some scores. Achievement scores in aggregate and various school courses were collected from school records,
which served as dependent variable in the analysis of variance for achievement.

(4-2) Preliminary Sample:

A) A sample of 1149 females studying in IX grade was drawn from various schools. Schools were quite homogeneous with regard to methods of teaching, evaluating, and socio-economic status, almost all schools being government controlled. Large sample was mainly taken to pick up extreme groups of intelligence-anxiety combination. School population was preferred in order to get larger variability in intelligence and anxiety scores.

These subjects were tested on the GMAT (Singh, 1966) and the STAI (A-trait) scale (Spielberger, et al., 1973) in small groups. Subjects (Ss) were insured of perfect secrecy of their results. Intelligence test was administered first. Instructions written on the title page were read out and example problems were demonstrated. When all the students understood their instructions, they were told to start. This test has time limit of 20 minutes and items are spread on five pages. So after each four minutes Ss were intimated about the time, so that they could speed up accordingly. Scoring of intelligence test was done with the help of scoring key provided with it.

Next to intelligence test Ss were asked to fill the STAI (A-trait) questionnaire. They were asked to read the instructions, written on the STAI A-trait form, carefully. To make them understand the test more clearly, instructions were explained to them verbally. They were told not to leave
any question unanswered. Scoring was done as described in the test manual of the STAI (Spielberger, et al. 1969).

(B) Final Sample:

240 Ss for the final sample were selected on the basis of their scores on anxiety (A-Trait) and intelligence tests. Extreme groups were formed by taking Ss scoring above and below mean ± 1SD on both tests, i.e., anxiety and intelligence. The extreme values thus secured for anxiety were 49.99 and 36.73; for intelligence values were 54.10 and 27.00. A few borderline cases had to be included from low intelligence group in order to make possible the combination of LI-LA group. A large number of the subjects falling in the range of low intelligence were high on anxiety score.

<table>
<thead>
<tr>
<th>Table 4-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Means and Sds of 240 Ss on Anxiety and Intelligence Tests</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Intelligence</td>
</tr>
<tr>
<td>Anxiety (A-trait)</td>
</tr>
</tbody>
</table>

Thus, four experimental groups were formed as follows:

- High intelligence - High anxiety (HI-HA)
- High intelligence - Low anxiety (HI-LA)
- Low intelligence - High anxiety (LI-HA)
- Low intelligence - Low anxiety (LI-LA)
Table 4-2
Table of Means and SDs of the Four Experimental Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Ss</th>
<th>Intelligence</th>
<th></th>
<th>Anxiety</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>HI-HA</td>
<td>60</td>
<td>59.0</td>
<td>7.29</td>
<td>47.0</td>
<td>5.9</td>
</tr>
<tr>
<td>HI-LA</td>
<td>60</td>
<td>58.0</td>
<td>5.1</td>
<td>34.4</td>
<td>3.0</td>
</tr>
<tr>
<td>LI-HA</td>
<td>60</td>
<td>20.7</td>
<td>5.72</td>
<td>49.0</td>
<td>4.29</td>
</tr>
<tr>
<td>LI-LA</td>
<td>60</td>
<td>30.0*</td>
<td>8.29</td>
<td>34.9</td>
<td>3.02</td>
</tr>
</tbody>
</table>

*Mean difference in low intelligence grouping has come up because of taking a few borderline subjects — as group was to be completed — this combination was most difficult to find.

These four groups of 60 Ss each were selected such that (a) the high and low intelligence groups had approximately similar distribution on STAI (A-trait), and, (b) the high and low anxiety groups had similar distribution of intelligence scores.

Further, these Ss were assigned to two conditions: Stress and Control. So, finally eight cells were formed, with each of the cells, consisting of thirty subjects.
### Table 4-3
**SAMPLING DESIGN**

(a) Distribution of Ss on the basis of Trait-Anxiety

<table>
<thead>
<tr>
<th>Trait-Anxiety</th>
<th>Control</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of Ss</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>HA (120)</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>HI (60)</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>LI (60)</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

(b) Distribution of Ss on the Basis of State-Anxiety

<table>
<thead>
<tr>
<th>State-Anxiety</th>
<th>Control</th>
<th>Stress</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of Ss</td>
<td>160</td>
<td></td>
</tr>
<tr>
<td>HA (80)</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>HI</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>LI</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>
4-3 Tools Used

4-3(A) Hindi Version of State-Trait Anxiety Inventory (STAI)

The State-Trait Anxiety Inventory (STAI) provides reliable, relatively brief, self-report measure of State (A-State) and Trait (A-Trait) anxiety. Though originally developed for use among normal adult population, its application has been found worthwhile in wide variety of fields, such as junior and senior high school students, medical and surgical patients, etc.

For purposes of facilitating cross-cultural research and to build an instrument for measuring A-State and A-Trait STAI subscales were translated in Hindi (Spielberger, Sharma, and Singh, 1973), using the same general approach that had proved successful with the Spanish edition of STAI (Spielberger, et al., 1971).

In preparing the Hindi translation, essential content of the original STAI items has been maintained while advantages of some special psycholinguistic characteristics of the Hindi language has been taken. For example, the Hindi verbs 'Raha Hun' and 'Rehta Hun' correspond nicely with the concepts of the transitory state and a relatively stable trait respectively. For items expressed in terms of English idioms, care has been taken to translate the feeling connotation of the idioms rather than the literal meaning of individual words.

In order to establish the equivalence of the Hindi and the English forms of the STAI, they were administered in four counter-balanced order to bilingual university post-graduate students. The means for the Hindi and English editions of the
STAI A-Trait Scales were comparable and the correlation was .88. The correlation between the Hindi and English A-state was .85.

The high values of itemremainder correlations and Cronbach alpha co-efficients showed that the Hindi version is internally consistent and items comprising it are quite homogeneous as is the case with the English version. Test-retest correlations for the Hindi STAI A-State and A-Trait scales attested the reliability of both the scales. For A-State scale correlations were consistently lower varying from .66 to .37 over a period of 30 and 90 days. In contrast, the Hindi STAI A-Trait scale was stable over time as indicated by high test-retest correlations for this scale, which ranged from .77 and .83 over the same period of days and these correlations are comparable with the English STAI A-Trait scale.

The high correlation between the Hindi and English STAI A-Trait scale indicates that these scales may be considered as equivalent forms for Hindi-English bilingual Ss. The high correlations obtained between the Hindi STAI A-Trait Scale and the IPAT and Sharma MAS measures of trait anxiety demonstrate the concurrent validity of the Hindi STAI A-Trait Scale.

STAI A-Trait Scale measures individual differences in anxiety proneness (Appendix 1-a). This scale is generally used to select Ss, for research purposes, who vary in their disposition to respond to psychological stress with different levels of A-State. Whereas, STAI A-State (Appendix 1-b) scale has proved to be a very useful index in situations where A-State intensity,
induced by successful experimental procedure or the level of drive, has to be measured.

The STAI A-State scale consists of 20 statements which ask people to respond according to how they feel at a 'particular moment in time'. The STAI A-Trait scale consists of 20 items which ask people to report how they 'generally feel'. The range of possible scores of the STAI varies from a score of 20 to 80 on both the subscales. Ss respond by rating on four categories, which, for the A-State scale are: 1. Not at all; 2. Somewhat; 3. Moderately so; 4. Very much so. The categories for A-Trait scale are: 1. Almost never; 2. Sometimes; 3. Often; 4. Almost always. The STAI A-State is balanced with ten items scored directly and ten reversed items. The STAI A-Trait has seven reversed items and thirteen directly scored items.

Hindi version of STAI subscales appears to provide a useful, internally consistent, reliable and valid scales for measuring state and trait anxiety. It's indeed impressive that only six years after publication, more than 580 studies on various versions of the STAI have been completed. Moreover, the STAI has been carefully translated into Spanish, French, Italian, Swedish and Turkish languages. In addition, preliminary translation of the STAI are available in Danish, German, Greek, Hebrew, Hungarian, Japanese, Malay, Norwegian, Polish, Rumanian, Russian, Slavic, Vietnamese, Luganda and Swahili (Spielberger and Diaz-Guerrero, 1976). The vigorous method used for various translations have been discussed by Spielberger and Shamma (1976). Thus sufficiently well-
standardized versions of the STAI permit a great deal of genuine cross-cultural research on the self-reporting anxiety.

4-3(b) Hindi Version of Hundal's General Mental Ability Test (Singh, 1966):

Hundal's "GMAT" (1962) is a group test designed to measure the general mental ability of the Punjabi speaking students 13 to 17 years of age. It consists of seven sub-tests of Number-series (NS), Analogies (Ana), Classification (C), Inferences (Inf.), Following Direction (FD), Opposites (Opp.), and Synonyms (Sy.). In all there are hundred items arranged spirally in ascending order.

The Hindi version of this test was prepared by translating this test into Hindi and replacing the vocabulary items by comparable Hindi items reported by Java (1965).

The split-half reliability co-efficients for different class groups VII to XI (Amir Singh, 1967) range from .85 to .88. The test-retest reliability co-efficient with a time gap of about three months for the students of IX class was .71 (N=175). The split half reliability coefficients for different sub-tests range between .43 to .84.

The validity of the test has been reported in terms of construct validity and content validity which also includes factorial validity. The factorial structures for different class groups (VII, IX, XI) has shown that the contribution of the common factor, at each class level, virtually accounts for the total common variance. The test is thus truly a measure of "general mental ability".
It is important to mention that the test material has direct association with school education and as such the performance on this test is influenced by formal and informal learning in the school and society. Cattell (1963) has pointed out that tests of this type are dominantly measures of acquired intelligence.

4-3(c) Learning Tasks:

Different learning materials differ in kind and processes required in acquiring them. Differences among learning tasks may be an important variable in studies investigating the effects of various personality correlates on learning.

Verbal learning has attained great importance in studies dealing with human learning. Nonsense syllables and meaningful syllables differ in terms of calibration of verbal material which include, meaningfulness, specific associations, frequency, sequential dependencies. The serial verbal learning and paired-associate learning tasks have been most often used in verbal learning experiments. For this study, two tasks (serial verbal learning and paired-associate learning) of moderate difficulty level were prepared.

(a) Construction of Learning Tasks

(1) Serial Verbal Learning Task: Selection of items:

A study was conducted taking two hundred three letter combinations of Roman alphabet of CVC form (Appendix 2). Words were selected randomly from Glaze's (1928) list with associative values ranging from 40% to 53%. This re-evaluation was done mainly to cover up cultural and linguistic differences
in Indian and American population. In addition to this, it was felt that meanings of words change from time to time and by now an indeterminate number of so-called nonsense syllables might have become acceptable words.

A sample of 100 high school boys served as Ss in the study. The stimulus items were administered in printed test booklet forms. 40 items appeared on each page arranged in horizontally form. Each item had a serial number and enough space was left opposite the stimulus word to enable the subject to report his response. Time of response was controlled by the E with the help of stop-watch. To aid the subject in keeping his place on the response sheet, serial number of each item was signaled verbally. Before the presentation of sheets Ss were given verbal instructions, to try not to miss any syllable and that in the prescribed time of 5 secs. they could write as many words as occur to them in any language they liked.

While determining the percentages of Ss reported associations to trigrams as meaningful, following criteria, based on studies by Noble (1961), Archer (1960), Mandler (1955), were kept in mind: Meaning, pronunciation and rhythm, frequency, two similar letters to those in stimulus word, antonyms (e.g., YEZ - YES - NO), response letters including all the three letters of the stimulus word. With the help of four judges, responses which measured up to any of these criteria were selected or counted. Percentages were sought which ranged from 72 to 0, maximum being for the syllable WEN and minimum for QAF, QEZ. Syllables starting with the letter 'Q' elicited relatively less associations.
A test list of 12 syllables of low similarity, high associative value, (of 46% - 64% average being 52.9%), was prepared. A practice list of six nonsense syllables of high associative value was also prepared. While making the test list rules applied in Montague's (1953) list number II and those followed by Spielberger and Smith (1966) were followed. Some of them being: (a) No repetition on left side; b) Z, P, H, were repeated on right side; c) Crosswise repetition of P, H, T, F, J, X, G; and d) two similar pronouncing words (SCH and GCH) were included (Appendix 3-a). Though syllables were selected on the basis of their association value, yet in order to further testify that task was genuinely of moderate difficulty pilot work was done, results of which assured of its difficulty level. The same list was used in final study.

Intra-list similarity refers to the degree to which the units comprising a learning list are alike. Highly similar items tend to be confused with one another and are difficult to distinguish. Similarity is an index of meaningful and associative relationships among the items (Jung, 1968). Therefore, they are less discriminable and are subject to inter-item interference. Hence learning becomes highly difficult. In order to reduce interference and prepare a list of moderate difficulty, syllables having low inter-item similarity were arranged in such a way that vowels were spread equally in whole of the list.

(ii) Paired-Associate Learning: Selection of Items:

Except for the arrangement of elements in serial order, the patterning of verbal items that has been most frequently
used in experimental studies is that of paired-associate learning.

A non-difficult, competitive task of paired-associate learning was prepared following the method employed by Sessermath Kight, and Athey (1964) in list II. Test list contained twelve S-R pairs of high associative value. S-R pairs were picked up from the list prepared by Verma (1972), who ventured to establish associative values of about seventy meaningful Hindi words of common use on a high school sample. Word pairs selected for this study, represented four common-phrases, five antonyms, and three synonyms (Appendix 3-b). The reason for this method of pairing words was to prevent subjects from discovering a principle or rule that worked for all twelve pairs, thus bypassed the necessity of rote learning. In order to provide response competition in learning, the response words were randomly assigned to twelve stimulus words. In this random arrangement special care was taken to avoid any logical or syntactic relation between the pairs.

Theoretically speaking each pair was independent of the other pairs, since each item was involved only in one pair. In a list where there is high similarity among the total set of items, some associations are liable to effect adversely other associations. Therefore, pairing of words was done in such a way that none of the items could cause any interference in the formation of associations between pairs of words. Order of presentation was not changed as the possibilities of rote learning were eschewed by the response competition as well as by making it clear in the instructions that association was to
be formed of each stimulus word to its respective response word and not between the entire list. Studies have indicated that serial order cues lose their importance as more trials are given (McGeoch and Underwood, 1953).

(b) Pilot Survey of Learning Tasks:

As has been stated above, two tasks (Serial Verbal learning and Paired-associate learning) of moderate difficulty level were prepared. To confirm the level of difficulty on the sample taken in the present study, pilot work was done.

70 (Seventy) Ss were selected for pilot work out of the preliminary sample on the basis of their scores on intelligence test. Groups of high-and low-intelligence were derived by including the Ss who obtained scores above and below mean ± 1/2 SD.

First of all serial verbal learning task was presented. A practice list of five nonsense syllables of high association value and test list of 12 nonsense syllables of the CVC form were used. After standard instructions the practice list was presented with the help of Hull type memory drum at a rate of 2 secs. exposure of each item followed by test list. Ss were instructed to learn the list by method of anticipation. Each S's responses were recorded and mean number of correct-responses were graphically presented.

After some rest, paired-associate list was exposed. Practice list consisted of five S-R pairs with high associative values and test list consisted of 12 S-R pairs. Speed of exposure was same as it was for serial learning list. Standard
instructions for paired-associate were given with emphasis on learning the response word in association with the respective stimulus word, by the method of anticipation. Responses were noted down.

Mean number of errors and trials were plotted for both the serial and paired-associate learning tasks (Appendix 4). Graphic presentation further confirmed the task was of moderate difficulty level. There were no floor or ceiling effects.

The sequence of presentation and procedure followed in try-out was kept exactly the same as it was to be for the final study. After the try-out findings task was thought to be appropriate for use in final study.

4-3(D) Academic Achievement:

Academic achievement data consisted of marks secured in the annual examination in aggregate and various school courses, i.e., English (foreign-language), First language (mother-tongue), Mathematics, General-Science, and Social-Studies. Achievement scores were obtained from the record registers of the schools concerned. Preliminary sample taken in this study was 1449 Ss. Sample being very large a number of schools had to be taken, so it became very important to be sure of the uniformity in the school courses, methods of teaching, methods of conducting the examinations, academic standard of the schools, socio-economic status, etc. In order to control these extraneous factors all the government controlled schools were taken, where homogeneity could be assumed safely. The only possible loophole in the homogeneity was teacher's prejudice, particularly in case of
assessment being made by the teacher concerned with the class for whole of the academic year. To overcome this loophole, achievement scores of 10th grade were considered which were based on a uniformly conducted examination by the same Board of School Education. The results of such examinations have been shown to be fairly reliable (Sharma, 1970). The data for achievement was analyzed for the sample of 240 Ss, who participated in learning tasks.

4-4 Procedure and Administration of Learning Tasks:

The learning tasks were presented to the subjects in a particular sequence (Serial learning, then paired-associate learning) which was kept same for all the groups and for all the subjects. In all, there were eight groups - half were run under stress instructions and half under neutral or control instructions. A-Stage measures were invariably taken after each task. Both the tasks were administered individually to all the subjects in one sitting.

4-4(a) Procedure for Ego-Stress:

In order to induce ego-stress, the following procedure based on Spielberger and Smith (1966) and Sharma and Wangu (1976) studies was followed. Prior to the administration of learning tasks, Ss were instructed to perform a brief concept attainment task (Hanfmann and Kassanin, 1942). With the help of false norms they were given the impression that anyone with even little capacity to think and reason out, could perform the task successfully within a given time-limit. They were told, "The task you are going to perform is related to some kind of
intelligence, it will also reflect your power of clear thinking."

Stop-watch was started as soon as the subject attempted to solve the problem. Soon enough the time was over and the subject was asked to leave it there. As expected, none of the subjects could attain the level of performance as was required by the false norms. Hence, failure or ego-stress was induced.

Further, they were told, "See, you failed on this very task. I'll give you some more tasks one by one. They all deal with somewhat different kind of thinking and intelligence. As you have already been unsuccessful on one test, you can still try to compensate for that failure. Now, first of all, you are to memorize a list of words. There is some empirical evidence indicating positive relationship between intelligence and learning of such tasks as one to be given to you shortly. Here is a graph which makes the findings quite clear." Then Ss were shown a hypothetically drawn graph in which number of correct responses increased rapidly as a function of intelligence. Subjects were told, "You see, a person with low IQ learns the words slowly as speed of learning is a function of intelligence, as intelligence increases speed also increases."

4-4(b) Procedure for Neutral Instructions:

These Ss were given standard instructions for the serial-anticipation method of learning, followed by practice list. Upon completion of the practice trials, Ss were told to: "Spell out all the syllables aloud as they appear first time and after that try to spell out the syllable which follows the one you see in the opening." No feedback was given.
Instructions and Administration of Serial Verbal Learning:

Following the ego-stress instructions Ss were given standard instructions for the serial learning task. Apparatus used was Hull-type memory drum. Ss were to learn the list by anticipation method. Speed of 2 seconds exposure for each syllable was kept constant. Syllables were written on a long white sheet, attached to the memory drum. Subjects were instructed as follows: 'Here, through these windows you'll be shown three-letter nonsense syllables, your task is to memorize them in their respective sequence. One by one spell out each syllable as it appears in the window for the first time. After that try to spell out the syllable which follows the one you see in the opening. If anything is not clear, do ask.'

Practice list of six words of high associative value was exposed to assure that subjects did follow the instructions clearly. Then test list was repeatedly presented until S either attained the learning criteria of two successive errorless anticipations or reached a maximum of 25 trials. Inter-trial rest of 10 seconds was given after each trial. Responses were noted down on the record sheet.

Ss in the control group were given regular instructions for the serial learning task. They were not given any kind of feedback.

On the completion of learning task Hindi version of A-state (Spielberger, Shama & Singh, 1972) was administered to all the subjects invariably with the instruction to fill the questionnaire according to how they felt while performing the task. Emphasis was laid upon their reporting just as they were feeling when the learning was going on.
After this without much rest, instructions for the next task followed.

\[4.4(d)\] Instructions and Administration of Paired-associate Learning:

The list of paired-associate words was fixed on the memory drum, at the speed of two seconds exposure. Subjects were given following instructions: "Now you'll be shown some pairs of words in Hindi through two of these windows. First one word will appear, read it aloud, then another word joined with it, thus making it a pair, will appear. Read the complete pair. Again one word, then the complete pair and so on. Keep on reading. You are to memorize the second word in association with the first one. When you go through the list for second time try to anticipate the second member as soon as the first member makes its appearance. You will be repeatedly shown this list of pairs until you memorize and anticipate all the pairs correctly. To understand it more vividly, please, see the words appearing in the window."

A practice list of five pairs of words was exposed to make them familiar with the task they were to perform. Subsequently, test list of twelve pairs was exposed, in the sequence of stimulus, stimulus - response. Subject was expected to anticipate the response word on the appearance of stimulus. If the response was wrong or if there was no response in time, it was counted as an error and was noted down in the record sheet. At the same time, the correct response was shown through the memory drum. Even when the subject gave a correct reply, the whole pair appeared in the window, which served as an reinforcer to the subject. Emphasis was on the
association between two members (stimulus and response). All the pairs were exposed until the subject reached the criteria of two successive errorless trials or twenty-five trials. Subject was once again asked to respond to the STAI A-State questionnaire. By this time subject was aware of the instructions, so nothing much was there to be told except that responses were to be according to how she was feeling during this very experiment which she had just finished.

4-5 Redistribution of Sample in terms of A-State:

Design of the study provided two A-state (state anxiety) scores, one after the administration of serial verbal learning task and the other after administration of paired-associate task. Regrouping was done on the basis of A-state scores irrespective of A-trait (trait anxiety) grouping. As Ss differed in their two A-state scores, separate groups (anxiety-intelligence combination) had to be made. Means and SDs for the groups based on A-state scores obtained after serial learning task and intelligence are presented in Table No.4-4, and means and SDs for the groups based on A-state scores obtained after paired-associate learning task and intelligence are given in Table No.4-5.
### Table No. 4-4

**Table of Means and SDs for the Four Experimental Groups**

(After Serial Learning Task)

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Ss</th>
<th>Anxiety (A-state)</th>
<th>Intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>HI-HA</td>
<td>40</td>
<td>63.3</td>
<td>5.05</td>
</tr>
<tr>
<td>HI-LA</td>
<td>40</td>
<td>29.4</td>
<td>3.5</td>
</tr>
<tr>
<td>LI-HA</td>
<td>40</td>
<td>63.8</td>
<td>9.8</td>
</tr>
<tr>
<td>LI-LA</td>
<td>40</td>
<td>29.4</td>
<td>4.6</td>
</tr>
</tbody>
</table>

### Table No. 4-5

**Table of Means and SDs for the Four Experimental Groups**

(After P-A Learning)

<table>
<thead>
<tr>
<th>Group</th>
<th>No. of Ss</th>
<th>Anxiety (A-state)</th>
<th>Intelligence</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>HI-HA</td>
<td>40</td>
<td>60.0</td>
<td>3.9</td>
</tr>
<tr>
<td>HI-LA</td>
<td>40</td>
<td>29.6</td>
<td>4.7</td>
</tr>
<tr>
<td>LI-HA</td>
<td>40</td>
<td>60.0</td>
<td>6.7</td>
</tr>
<tr>
<td>LI-LA</td>
<td>40</td>
<td>28.0</td>
<td>5.3</td>
</tr>
</tbody>
</table>