Chapter V

STANDARDIZATION PROCEDURE - I

PRE-TRYOUT, TRY-OUT AND ITEM ANALYSIS

The test items, which were constructed and revised on the basis of expert opinion, were to be tried out experimentally on a sample of testees, before they could be finally selected.

The process of experimental try-out is divided into three stages - pre-tryout, try-out and final administration. The present chapter deals with the first two stages.

(A) PRE-TRYOUT

The manuscript of the test was administered individually to 14 students and then to a class of 100 Pre-University students. This pre-tryout was aimed at gaining information regarding the properness of

language used, properness of technical construction of items, adequacy and clarity of instructions etc.

(a) Pre-tryout on Individuals

In this exploratory stage, the investigator was concerned about :

(1) whether the directions and instructions were worded properly as to be uniformly and clearly understandable.

(2) the time-rate at which the test items were attempted.

(3) locating the hidden troubles - the bugs - in the test.

With these points in mind, he administered the test individually to 14 S.S.C. students in April, 1970, under his personal supervision. These students included boys, girls, students from upper middle class and with rural background, etc. The instructions were written along with the tests and were also given orally. No time-limit was prescribed. The students were permitted to ask for clarification about anything pertaining to the test.

As the students took the test, asked questions and sought clarification, and also discussed test items, the investigator observed them and took notes of their

querries and troubles. This gave him a deeper insight into the real nature of various test items and the mental processes that the students would employ while attempting them.

On the basis of this new insight, the test-items and instructions were modified in form and sometimes in content also. The investigator also rearranged the items on the basis of difficulty that the students were found to experience at the time of individual pre-try-out (except for tests 1.1 and 3.1(a) in which items were arranged in alphabetical order. Even they were arranged according to difficulty value after item-analysis.).

(b) Pre-tryout in a College Class

The insight gathered during the individual try-out needed to be strengthened through a group try-out. Again, special problems of administering the test in a group, rather than to individuals, were to be found out. So the test, as modified on the basis of individual pre-tryout, was cyclostyled and administered to a pre-university class of 100 students.

Special care was taken that the cyclostyled material was neat, attractive and clearly legible.

Special attention was given to correct spelling, correct typing etc.

On the basis of the information gained from the scoring of this test-version, some new and effective distractors were substituted for old and ineffective ones.

The pre-tryout in the group of 100 also indicated that the time required for the whole test was about 205 mts. It was found that -

Part I required 58 mts.;
Part II required 43 mts.;
Part III required 56 mts.; and
Part IV required 47 mts.

Accordingly, at the time of second try-out on 370 pre-university class students, the students were allowed as much time as needed. They were asked to write on the answer sheet the time they required to finish each part.

(B) TRY-OUT

After the modifications effected in the pre-tryout version on the basis of the insight gained through the pre-tryout, the test was ready for the try-out on a larger sample, which would then lead to item-analysis.

(a) Sample

The modifications made the test-form fit for administration to sizeable groups of individuals having approximately the same characteristics as the population for which the test was ultimately to be used. Therefore, the first question was the selection of a sample for the try-out. Before finally selecting the sample for any research, the researcher is faced with the problems such as -

(1) how to select the most representative sample, and

(2) how large the sample should be.

Answer to the first question depends upon the purpose of the test. In view of the purpose of the present work, the test should be administered to a sample which represented faithfully the college-entrant population, that is the pre-university class students. The closer the resemblance, the more directly sample statistics will be applicable to the population ultimately to be used. The sample should be such that it would possess all the characteristics in the same proportion and would have all stratifications as the wider population would possess and have. Then only sample statistics would reasonably approximate the population parameters.

The answer to the second question depends upon the purpose of the try-out and the degree of validity and reliability the investigator desires. It is well known that the larger the number of subjects tested, the greater is the reliability of results. The try-out, in the case of the present test, was meant to provide statistical data for item-analysis - that is data about the test as a whole, about the individual test-items and about the relation of each one of the test-items with the test as a whole. The investigator decided to follow for item analysis the method developed by Flanagan, the most efficient method for estimating the biserial correlation (r_b) for an item. The method is designed for use when the middle 46 % of examinees on total score have been eliminated and each tail contains 27 %. It has been recommended that the Flanagan 'r' be used when 100 cases remain in each tail, which means examining a sample of approximately 370.

Thus, a sample of 383 students from four pre-university classes was tested. The sample was selected on a stratified-random-selection basis. The composition of the sample was made to reflect the population as representatively as possible. The names of the colleges are as follows :

Table : 5.1

	Name of the College		No. of Students Tested	
			Initial No.	Final No.
1.	P. T. College of Science,	SURAT.	103	100
2.	H. L. College of Commerce,	AHMEDABAD.	92	90
3.	Raman Brothers Arts & Commerce College,	BARDOLI.	76	70
4.	Shamaldas College of Arts,	BHAVNAGAR.	112	110
			383	370

Afterwards, the data of 13 students was rejected, and item-analysis sample was stratified as follows :

A. Sex-wise		B. Locality-wise (Students residing)		C. Faculty-wise	
Boys	214	Rural	70	Arts	140
Girls	156	Semi-urban	110	Science	100
		Urban	190	Commerce	130
Total	370	Total	370	Total	370

The strata approximately represent the proportion they have in the larger pre-university student population. But within each stratum, the selection was random as far

as possible. The colleges were also selected at random from the total list of colleges in Gujarat.

The try-out was administered in June, 1971 to the pre-university class students when hardly 15 days had passed after their entrance to college. So the sample was representative of the population in this respect also.

Thus it will be evident from the tables given above that the sample for the try-out was a representative one from all standpoints - grade, sex, residence, faculty, time etc.

The try-out version was got printed in the form of four booklets, one for each part. The last four pages were not bound, because they were to be distributed separately.

(b) Instructions to the Testees

On the basis of the experience gained from the pre-tryout (individual as well as group), instructions for the students and the test-givers were prepared and printed. The general instructions for the students were printed on the front page of each part of the test-booklet. Specific instructions for each individual sub-test were printed in the beginning of each sub-test.

The written instructions were self-explanatory, yet some oral instructions were also given. General instruction no. 5 and 6, and specific instructions for sub-tests no. 1.2(a), 1.3, 2.2, 3.1(b), 4.2(a) were to be explained orally.

(c) Time Estimate

At the try-out administration, the testees were allowed as much time as they required and were asked to write at the top of the answer-sheet the time they took to complete each part of the test. Thus no time-limit was imposed.

There are theoretical grounds for doing so. According to Thorndike and Hagen (1961), when the results of test administration are to be utilized for item-analysis, it is necessary to administer the whole item pool with quite ample time limits, so that most individuals have a chance to try all items.

The four parts were administered on two different days. Part I was administered first; then an interval of 2 hours was allowed. Then Part II was administered. On the next day, Part III and Part IV were administered in the same manner.

The average time the students took was as follows:

Part I : 60 mts.

Part II : 45 mts.

Part III : 55 mts.

Part IV : 45 mts.

The following table shows the time-wise frequency distribution for each part:

Table : 5.2

TIME-WISE FREQUENCY DISTRIBUTION OF THE NUMBER OF STUDENTS FINISHING THE TEST IN THE TRY-OUT VERSION.

PART : I

Class Interval of Minutes	No. of Students
47 - 51	20
52 - 56	72
57 - 61	176
62 - 66	80
67 - 71	22
Total ...	370

Mean Time : 60 mts.

Table : 5.2
(Contd.)

PART : II

Class Interval of Minutes	No. of Students
33 - 37	17
38 - 42	75
43 - 47	192
48 - 52	73
53 - 57	13
Total ...	370

Mean Time : 45 mts.

PART : III

Class Interval of Minutes	No. of Students
49 - 52	47
53 - 56	267
57 - 60	56
Total ...	370

Mean Time : 55 mts.

Table : 5.2

(Contd.)

PART : IV

Class Interval of Minutes	No. of Students
38 - 40	18
41 - 43	63
44 - 46	197
47 - 49	71
50 - 52	21
Total ...	370

Mean Time : 45 mts.

The testees who finished the work earlier were allowed to leave the place. The maximum time for each part differed from college to college.

(d) Rapport

The investigator himself administered the try-out test. The authorities of the colleges, the teachers and the students of the pre-university classes cooperated in the work. The investigator motivated the students in the beginning by telling them about the importance of knowing the level of one's language ability. He tried to establish

rapport and create a smooth, permissive atmosphere. At the same time, they were encouraged to show their best worth on the test.

(e) Scoring

Scoring should be done very accurately and objectively. In the case of the present test, the try-out was scored by the investigator himself, using a cardboard stencil.

On the basis of this scoring, the following three calculations were done :

(a) Difficulty value of each item.

(b) Correcting the difficulty value for chance factors.

(c) Discrimination index of each item.

The account of this item-analysis procedure is given in section (C).

(f) Correction for Chance Success

Most of the items in this test are of multiple-choice type, although some of them are of matching type also.

In the case of multiple-choice type items, some testees might indulge in blind guesswork. They might

guess blindly among the choices presented and might come to mark the correct answer by chance alone. To compensate for this chance factor, a correction formula has been suggested. The formula, as suggested by Garrett (1962), is as follows :

$$P_c = \frac{R - \frac{W}{(K-1)}}{N - HR}$$

where

P_c = Percentage of correct response after correction for chance.

R = Number of students answering the item right.

W = Number of students answering the item wrong.

K = Number of alternatives.

N = Total number in the group.

HR = Number of students not reaching the item.

(C) ITEM-ANALYSIS

(a) Importance and Nature of Item-Analysis

The effectiveness of a test depends upon the effectiveness of the items comprising it. In both its validity and reliability, a test score is the resultant

of the component reliabilities, validities and inter-correlations of the component items of the test. In order to produce the most effective and useful test, each one of the pool of items from which the test is assembled should be studied. The choice of items for the final test-form is based on certain statistical characteristics of each item. These characteristics are mainly two - the difficulty level of the item for the group under study and the degree to which the item differentiates those who are higher from those who are lower on some standard.

The major objective of item analysis is to obtain objective information concerning the validity and effectiveness of the items written for the test. It provides an opportunity to the investigator to check up objectively his subjective judgement involved in the selection of items for the test. The testee's reaction to items are also learnt. In multiple-choice items it provides the index for the strength of distractors, revealing their relative popularity. The most common use of item-analysis, therefore, is in selection of best items for the final test form. Guilford (1936) is in favour of item analysis of a test that is designed as a power test or is close to a power test. He also states

that,

> it is more important to analyse aptitude tests rather than achievement tests.

Gulliksen (1950) very clearly marks out an important difference between item selection procedures for aptitude tests and those for achievement tests. He says,

> In the construction of aptitude tests the item statistics may be allowed to control the rejection and selection of items more fully than in the construction of achievement tests. The judgement of the subject matter expert always plays an important part in the selection and rejection of items for an achievement test.

The present test is an ability test or an aptitude test. Hence it needs a very scrupulous item analysis. But before proceeding further, some consideration of the dependability and the comparative values of the different methods of item analysis is necessary.

It can be said that indices of difficulty are much more stable than indices of item validity. From the reports produced by Gibbons and Carter it might be concluded that indices of difficulty are highly consistent from sample to sample even with N as low as 50. Indices of item validity (discrimination indices), however, tend to

be much less consistent among samples. In this connection it can of course be said that the type of test and tested population would undoubtedly have bearings on the stability of item indices.

(b) Preparing Item Analysis Data (Scoring)

After the try-out administration was over, the test was scored. For scoring it, punched key technique (which consists of a plain light card board sheet on which standard scoring keys were punched) was selected. This technique was selected because in it scoring can be done very rapidly, specially when the score is simply the number right.

The scoring was done by counting right and wrong responses. The percentage of correct responses for each item was calculated. This was the difficulty index for the item, which was then corrected for chance success.

(c) Difficulty Indices

As stated above the correction formula for chance success was applied to raw difficulty indices. For this Garrett's formula described above was employed.

Then two groups - the high scoring and the low scoring group - were formed. The procedure for the formation of groups was as follows :

(1) The testees were assigned ranks. The student getting the highest rank was ranked first while that getting the lowest was ranked last.

(2) All answersheets were arranged in order of ranks.

(3) From the pile of 370 answersheets the upper 100 sheets were taken to form the 'high group' while the lower 100 sheets were taken to form the 'low group'. They represented the upper 27 % and the lower 27 % of the total sample.

(4) The middle 46 % of the testees were, then, discarded.

(5) After the formation of the two groups, the number of correct responses in each (i.e. high as well as low) group to each of 584 items in the test were calculated. As the number of respondents in each group was just 100, the acquired figure indicated the percentage of correct responses.

(d) Factors affecting Item Difficulty

The following factors are likely to affect the levels of difficulty of an item:

(1) the nature of its content and the type of behaviour it requires of an examinee,

(2) the possibility of unusual words occuring in an item, which influences responses to an item,

(3) awkward sentence structure and undue formality in the style of the language used,

(4) a shift from the use of the third person to the first person or the second, and

(5) even such apparently extraneous factors as the form of the item and the directions to examinees.

For eliminating the last four factors, the investigator took utmost care at the time of construction and pre-tryout of the test and necessary modifications were effected. Hence only the first factor affected the difficulty value of different items. And the first factor was the legitimate guide for discarding or retaining items and for arranging the retained ones.

In item selection, not only the item difficulty, but the item discrimination indices as well must be considered. This phase is described in the following section.

(e) Discrimination Indices

The term discrimination indices indicates both internal consistency and item validity.

Test validity might be established by comparing the scores on the test under standardization with the scores of some external criterion, finding out the correlation between the two. But here it is the question of item validity which means consistency with total score.

A number of methods have been devised for use in determining the discriminative power of an item. Out of these, four co-efficients of correlation are commonly used to indicate the correlation of an item with the total test score. These are (i) the biserial 'r', (ii) the point biserial 'r', (iii) tetra-choric 'r', and (iv) phi coefficient. But, as Garrett (1962) opines,

> the biserial correlation is usually regarded as the standard procedure in item analysis.

So it was decided to apply biserial 'r' for item analysis in the present test. Flanagan's table of biserial 'r' was used for calculating the discriminating index of each of the 584 items. The most satisfactory item validity index is the estimate of the coefficient of correlation between the item and the whole test score, obtainable from the table prepared by Flanagan, which

uses the percentage correct of the high group and the low group.

Since the magnitude of a correlation coefficient is determined by extreme cases to a much greater extent than by cases near the middle of the bivariate surface, an estimate of the coefficient may be obtained with a much greater decrease in labour than in accuracy, by utilizing only the data in the tails of the two distributions.

It might be conceded that the biserial 'r', read from the table, is slightly less accurate than is the usual biserial 'r' (statistically computed over the whole sample data). But the loss of accuracy is far outweighed by the ease of computation. Again, for a large sample as 370, even the high group and the low group consist of 100 subjects each. This large number makes computation more reliable.

(f) Item Selection

Item analysis provides information about the selection of items for the final version of the test, that is which items should be retained and which should be rejected (discarded). This can be done on the basis of difficulty and discrimination indices. But the crucial question is that of deciding the upper and lower

limits in respect of both the indices, that is the range of difficulty and discrimination indices within which an item might be retained and beyond which it might be rejected. The goal, apparently, is maximization of reliability and validity. Along with it, item analysis can help the investigator in arranging the items in the ascending order of difficulty.

Screening of items on the basis of difficulty and discrimination values can be undertaken only after a decision has been taken regarding the range of difficulty and discrimination that the investigator considers acceptable for his test.

Summer (1964) suggests the following proportions for selecting items on the basis of difficulty value:

Items of difficulty range:

from 0.	to 0.40	- 20 %
from 0.41	to 0.60	- 60 %
from 0.61	to 1.00	- 20 %

The present test comprizes of many subtests. This ascending order of difficulty value has been adhered to with regard to each subtest and not with regard to the whole test as such. The investigator

believes that this is the only logical way, when the test battery consists of many subtests.

For the present test, the investigator has discarded those items which had difficulty index either above .80 or below .20. This criterion also fulfils to a large extent the requirements of the standards laid down by Summer.

Table No. 5.3, given below, shows the difficulty value of each of the 584 items of the try-out version. Table No. 5.4 shows the frequency distribution of difficulty values of the items of final test version.

Table : 5.3

ITEM-ANALYSIS OF TRY-OUT VERSION

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
			Test : 1.1			
1	79	90	78	.21	R	1
2	72	82	67	.19	D	-
3	75	89	72	.26	R	4
4	58	80	57	.28	R	31
5	72	87	71	.22	R	6
6	74	87	69	.22	R	8
7	69	78	62	.19	D	-
8	75	88	71	.27	R	5
9	75	87	70	.22	R	7
10	72	86	68	.25	R	9
11	67	79	57	.26	R	32
12	70	86	65	.29	R	11
13	64	74	58	.18	D	-
14	19	27	10	.27	D	-
15	15	22	11	.21	D	-

Table : 5.3

(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. Final Version
16	61	84	58	.34	R	23
17	85	90	82	.16	D	-
18	57	79	56	.27	R	33
19	82	88	76	.19	D	-
20	16	24	8	.28	D	-
21	68	86	63	.31	R	15
22	70	86	64	.29	R	12
23	55	62	46	.16	D	-
24	68	86	65	.27	R	10
25	65	86	62	.31	R	16
26	57	80	55	.30	R	34
27	60	66	50	.17	D	-
28	65	85	62	.31	R	17
29	77	89	77	.21	R	3
30	56	79	55	.27	R	35
31	53	75	55	.22	R	36
32	52	75	54	.23	R	37

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
33	83	88	78	.16	D	-
34	15	22	11	.21	D	-
35	63	70	54	.17	D	-
36	61	84	58	.31	R	24
37	80	89	78	.21	R	2
38	81	83	79	.06	D	-
39	61	83	58	.28	R	25
40	17	22	12	.16	D	-
41	54	60	50	.17	D	-
42	68	77	62	.19	D	-
43	60	82	58	.28	R	26
44	81	83	79	.06	D	-
45	51	73	51	.26	R	39
46	60	82	57	.28	R	27
47	73	78	66	.15	D	-
48	69	78	62	.19	D	-
49	25	41	11	.41	R	50
50	51	74	53	.22	R	38

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
51	15	22	11	.21	D	-
52	25	43	11	.42	R	49
53	56	66	50	.17	D	-
54	74	82	70	.16	D	-
55	32	60	38	.23	R	43
56	63	74	58	.18	D	-
57	82	89	81	.15	D	-
58	64	84	61	.31	R	20
59	52	62	44	.19	D	-
60	62	84	59	.33	R	22
61	63	84	60	.32	R	21
62	18	24	14	.15	D	-
63	57	70	48	.23	R	40
64	19	23	17	.07	D	-
65	39	58	26	.33	R	45
66	53	66	46	.21	R	41
67	49	63	40	.25	R	42
68	65	81	56	.28	R	29

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
69	83	87	81	.07	D	-
70	69	86	65	.27	R	13
71	40	50	34	.17	D	-
72	35	53	21	.34	R	46
73	45	54	38	.16	D	-
74	17	29	10	.26	D	-
75	43	60	30	.31	R	44
76	83	86	81	.07	D	-
77	18	27	12	.23	D	-
78	69	78	62	.19	D	-
79	65	85	61	.31	R	18
80	83	88	78	.16	D	-
81	31	50	18	.36	R	47
82	28	47	12	.42	R	48
83	18	24	14	.15	D	-
84	68	81	57	.28	R	28
85	88	92	85	.14	D	-
86	12	18	8	.20	D	-

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
87	68	86	63	.31	R	14
88	51	65	41	.26	R	30
89	78	84	74	.18	D	-
90	64	85	60	.31	R	19
		Test : 1.2(a)				
91	82	88	79	.19	D	-
92	77	86	70	.22	R	51
93	68	82	62	.25	R	52
94	73	82	66	.20	R	53
95	63	74	54	.22	R	54
96	78	86	74	.18	D	-
97	62	73	54	.21	R	55
98	50	70	50	.21	R	56
99	57	65	46	.21	R	57
100	56	65	45	.21	R	58
101	54	63	43	.20	R	59
102	83	90	78	.21	D	-

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Ver-sion	Diffi-culty Index (%age Right in the Whole Test)	H Percent-age Right in Upper 27%	L Percent-age Right in Lower 27%	Discrimi-natory Index (Bise-rial 'r')	Reta-ined or Dis-car-ded	Item No. in Final Ver-sion
103	53	62	44	.21	R	60
104	53	66	46	.21	R	61
105	42	62	41	.21	R	62
106	60	70	54	.17	D	-
107	41	54	30	.25	R	63
108	40	50	30	.21	R	64
109	60	78	54	.27	R	65
110	42	70	18	.53	R	66
111	77	86	70	.22	R	67
112	69	82	64	.23	R	68
113	82	87	75	.19	D	-
114	52	66	42	.25	R	69
115	71	82	62	.25	R	70
116	61	74	50	.26	R	71
117	80	90	74	.26	R	72
118	81	92	75	.26	D	-
119	77	86	70	.22	R	73
120	73	82	66	.20	R	74

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
121	46	74	26	.48	R	75
122	55	60	50	.17	D	-
123	63	78	54	.27	R	76
124	63	74	54	.22	R	77
125	61	70	50	.21	R	78
126	22	34	14	.27	R	79
127	30	46	22	.27	R	80
128	31	42	18	.28	R	81
129	24	34	14	.27	R	82
130	62	74	56	.18	D	-
131	43	54	31	.25	R	83
132	43	58	30	.29	R	84
133	81	85	75	.17	D	-
134	41	58	30	.29	R	85
135	53	70	42	.29	R	86
136	69	82	58	.28	R	87
137	86	89	84	.11	D	-
138	32	50	18	.36	R	88

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Ver-sion	Diffi-culty Index (%age Right in the Whole Test)	H Percent-age Right in Upper 27%	L Percent-age Right in Lower 27%	Discrimi-natory Index (Bise-rial 'r')	Reta-ined or Dis-car-ded	Item No. in Final Ver-sion
139	33	46	17	.32	R	89
140	34	47	18	.32	R	90
141	57	66	46	.21	R	91
142	56	66	45	.21	R	92
143	82	86	74	.18	D	-
144	52	62	42	.20	R	93
145	39	53	34	.21	R	94
146	83	86	81	.07	D	-
147	41	54	34	.21	R	95
148	23	34	15	.26	R	96
149	35	46	22	.27	R	97
150	37	50	26	.26	R	98
151	35	54	18	.39	R	99
152	29	42	14	.34	R	100
153	34	50	18	.36	R	101
154	81	86	75	.17	D	-
155	51	74	34	.41	R	102
156	43	66	22	.45	R	103

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
157	43	58	34	.25	R	104
158	46	58	38	.16	D	-
159	41	50	30	.21	R	105
160	40	54	30	.25	R	106
161	45	58	38	.16	D	-
162	36	54	22	.34	R	107
163	35	50	18	.36	R	108
164	34	46	18	.32	R	109
165	23	34	14	.27	R	110
		Test : 1.2(b)				
166	69	78	58	.23	R	111
167	68	82	50	.36	R	114
168	65	78	50	.31	R	117
169	55	74	42	.33	R	113
170	51	66	34	.33	R	115
171	50	66	34	.33	R	116
172	44	62	30	.32	R	118

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
173	43	58	26	.33	R	112
174	37	54	22	.34	R	120
175	30	46	18	.32	R	119
		Test :1.3				
176	61	74	50	.26	R	125
177	59	74	46	.30	R	123
178	57	70	46	.25	R	121
179	50	66	38	.29	R	122
180	31	46	18	.32	R	124
		Test : 1.4				
181	82	88	77	.12	D	-
182	65	78	54	.27	R	126
183	62	70	50	.22	R	131
184	18	24	14	.12	D	-
185	58	64	55	.11	D	-
186	19	32	11	.32	D	-

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
187	60	74	46	.30	R	129
188	55	70	42	.29	R	128
189	51	66	38	.29	R	132
190	50	70	31	.40	R	127
191	50	62	38	.25	R	134
192	45	58	34	.25	R	130
193	42	58	30	.29	R	135
194	18	27	12	.23	D	-
195	32	42	24	.21	R	133
			Test : 1.5(a)			
196	67	78	58	.23	R	145
197	66	78	55	.27	R	136
198	62	74	49	.26	R	144
199	59	74	46	.30	R	138
200	56	70	46	.25	R	143
201	54	66	41	.25	R	139
202	53	66	38	.29	R	142

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
203	49	62	38	.25	R	137
204	40	54	27	.30	R	141
205	37	50	26	.26	R	140
		Test : 1.5(b)				
206	72	86	59	.33	R	146
207	70	82	58	.28	R	147
208	67	78	58	.23	R	148
209	19	25	14	.17	D	-
210	82	85	77	.13	D	-
211	64	78	54	.27	R	149
212	63	78	50	.31	R	150
213	59	82	38	.47	R	151
214	81	89	75	.26	D	-
215	56	78	34	.45	R	152
216	55	70	42	.29	R	153
217	43	70	26	.44	R	154
218	41	62	34	.29	R	155

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
219	18	29	12	.25	D	-
220	41	62	26	.36	R	156
221	39	66	34	.33	R	157
222	37	50	22	.31	R	158
223	36	54	20	.37	R	159
224	35	50	18	.36	R	160
225	83	88	79	.17	D	-
		Test : 1.6(a)				
226	54	76	35	.43	R	165
227	54	70	45	.25	R	161
228	42	63	36	.28	R	164
229	39	66	35	.32	R	162
230	36	51	17	.38	R	163
		Test : 1.6(b)				
231	15	22	11	.21	D	-
232	82	88	79	.17	D	-

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
233	83	90	78	.22	D	-
234	85	89	80	.18	D	-
235	65	78	54	.27	R	166
236	62	74	54	.22	R	167
237	60	74	46	.30	R	168
238	55	71	43	.27	R	169
239	50	71	30	.40	R	170
240	51	62	38	.25	R	171
241	46	58	35	.25	R	172
242	46	59	33	.25	R	173
243	66	78	55	.27	R	174
244	62	74	49	.26	R	175
245	53	66	38	.29	R	176
246	51	66	40	.27	R	177
247	17	29	10	.28	D	-
248	83	88	79	.17	D	-
249	81	89	74	.28	D	-
250	82	88	77	.18	D	-

Table : 5.3
(Contd.)

PART : I

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
			Test : 1.6(c)			
251	58	74	46	.30	R	180
252	61	74	46	.30	R	179
253	65	78	54	.27	R	178

PART : II

			Test : 2.1(a)			
1	82	88	77	.18	D	--
2	50	71	30	.40	R	14
3	50	70	31	.40	R	15
4	33	46	18	.32	R	24
5	73	82	66	.20	R	1
6	81	89	75	.24	D	--
7	65	78	54	.27	R	3
8	83	90	78	.22	D	--

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
9	68	81	62	.25	R	2
10	32	50	18	.32	R	23
11	18	31	11	.27	D	-
12	62	74	54	.22	R	4
13	81	66	77	.12	D	-
14	45	58	34	.25	R	16
15	81	90	74	.26	D	-
16	62	74	49	.26	R	5
17	45	59	32	.27	R	17
18	60	74	46	.30	R	6
19	51	62	38	.25	R	13
20	51	66	41	.27	R	12
21	37	50	26	.26	R	21
22	35	46	23	.27	R	22
23	58	74	46	.30	R	7
24	43	70	26	.44	R	18
25	41	63	26	.36	R	19
26	55	71	43	.27	R	9

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
27	19	31	11	.31	D	-
28	56	70	42	.29	R	8
29	54	70	45	.25	R	11
30	53	66	38	.29	R	10
31	40	54	27	.30	R	20
32	31	46	18	.32	R	25
			Test : 2.1(b)			
33	74	82	65	.21	R	26
34	45	60	32	.27	R	30
35	54	72	42	.31	R	29
36	69	82	62	.25	R	27
37	65	78	53	.28	R	28
			Test : 2.1(c)			
38	58	74	46	.30	R	34
39	18	30	11	.29	D	-
40	54	72	43	.28	R	36

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
41	49	62	39	.25	R	39
42	65	77	55	.26	R	31
43	46	74	28	.46	R	40
44	50	71	30	.40	R	38
45	83	88	79	.17	D	-
46	62	74	54	.22	R	32
47	55	71	43	.27	R	35
48	19	32	13	.30	D	-
49	82	90	78	.22	D	-
50	51	62	38	.25	R	37
51	81	89	74	.26	D	-
52	60	74	46	.30	R	33
		Test : 2.2(a)				
53	79	90	78	.21	R	41
54	76	89	72	.26	R	42
55	72	87	61	.30	R	43
56	73	87	69	.22	R	44

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
57	68	86	63	.31	R	45
58	65	85	62	.31	R	46
59	61	84	58	.31	R	47
60	60	68	46	.23	R	48
61	57	70	47	.25	R	49
62	52	66	46	.21	R	50
63	48	63	40	.25	R	51
		Test : 2.2(b)				
64	74	87	69	.22	R	52
65	75	89	71	.30	R	53
66	70	86	66	.27	R	54
67	67	75	57	.20	R	55
68	61	86	58	.35	R	56
69	53	75	55	.23	R	57
70	52	66	46	.21	R	58
71	49	62	39	.24	R	59
72	42	70	18	.53	R	60

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
73	41	54	30	.25	R	61
74	40	51	32	.21	R	62
		Test : 2.2(c)				
75	69	78	62	.19	D	-
76	64	74	58	.18	D	-
77	67	75	60	.18	D	-
78	55	62	46	.16	D	-
79	60	66	50	.17	D	-
80	63	70	54	.17	D	-
81	56	66	50	.17	D	-
82	17	22	12	.16	D	-
83	15	22	11	.21	D	-
84	19	23	15	.13	D	-
85	31	42	26	.18	D	-
		Test : 2.2(d)				
86	83	89	82	.09	D	-
87	85	90	82	.16	D	-

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
88	83	87	79	.13	D	-
89	83	88	78	.13	D	-
90	81	83	79	.14	D	-
91	73	78	66	.15	D	-
92	69	78	62	.19	D	-
93	63	74	58	.18	D	-
94	52	62	44	.19	D	-
95	45	54	38	.16	D	-
		Test : 2.2(e)				
96	79	88	76	.20	R	63
97	75	86	70	.22	R	64
98	73	87	65	.28	R	65
99	65	85	62	.31	R	66
100	67	75	57	.20	R	67
101	61	84	58	.31	R	68
102	49	62	39	.26	R	69
103	48	63	40	.25	R	70
104	44	54	35	.20	R	71

Table : 5.3
(Contd.)

PART : II

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
105	43	58	30	.29	R	72
106	41	57	30	.29	R	73

PART : III

Test : 3.1(a)

1	21	33	12	.30	R	90
2	32	42	23	.22	R	80
3	33	42	25	.20	R	79
4	83	89	81	.15	D	-
5	44	57	36	.24	R	55
6	43	66	22	.45	R	56
7	86	90	82	.16	D	-
8	31	46	18	.32	R	81
9	82	87	79	.15	D	-
10	29	46	18	.32	R	83

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
11	81	88	78	.16	D	-
12	81	83	79	.06	D	-
13	18	27	12	.23	D	-
14	53	66	37	.29	R	20
15	64	74	58	.18	D	-
16	44	58	34	.25	R	54
17	68	78	62	.19	D	-
18	64	74	58	.18	D	-
19	30	46	17	.32	R	82
20	63	70	54	.17	D	-
21	34	46	18	.32	R	78
22	61	84	56	.33	R	9
23	66	75	60	.18	D	-
24	48	63	40	.25	R	38
25	53	65	39	.28	R	21
26	55	62	46	.16	D	-
27	53	66	38	.29	R	19
28	36	54	20	.37	R	72

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
29	59	67	49	.19	D	-
30	52	66	38	.29	R	24
31	63	70	54	.17	D	-
32	56	66	50	.17	D	-
33	72	87	61	.30	R	5
34	47	60	32	.30	R	42
35	49	61	35	.28	R	34
36	47	58	36	.23	R	40
37	54	66	41	.25	R	18
38	31	42	26	.18	D	-
39	48	62	38	.25	R	39
40	48	63	39	.25	R	37
41	46	54	39	.15	D	-
42	37	60	35	.27	R	68
43	17	22	12	.16	D	-
44	19	24	16	.13	D	-
45	37	50	22	.31	R	71

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
46	45	61	33	.27	R	51
47	18	29	12	.25	D	-
48	68	86	63	.31	R	6
49	19	31	11	.31	D	-
50	45	64	30	.35	R	49
51	44	64	28	.39	R	53
52	18	30	11	.29	D	-
53	35	48	22	.29	R	77
54	35	50	20	.32	R	75
55	36	55	20	.38	R	73
56	83	88	79	.16	D	-
57	19	32	13	.30	D	-
58	52	66	35	.30	R	23
59	81	89	74	.26	D	-
60	37	50	22	.31	R	69
61	72	88	66	.32	R	4
62	38	66	35	.32	R	67
63	46	58	39	.19	D	-

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
64	52	66	34	.31	R	22
65	48	62	39	.25	R	36
66	23	34	15	.26	R	89
67	68	78	62	.19	D	-
68	61	74	56	.23	R	8
69	37	50	23	.30	R	70
70	49	70	32	.38	R	35
71	83	90	78	.21	D	-
72	60	74	46	.31	R	10
73	27	46	11	.44	R	86
74	19	27	10	.27	D	-
75	60	74	50	.26	R	11
76	47	74	26	.48	R	41
77	35	46	23	.27	R	76
78	61	84	58	.31	R	7
79	54	70	42	.29	R	17
80	44	62	30	.32	R	52

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Ver-sion	Diffi-culty Index (%age Right in the Whole Test)	H Percent-age Right in Upper 27%	L Percent-age Right in Lower 27%	Discrimi-natory Validity Index (Bise-rial 'r')	Reta-ined or Dis-car-ded	Item No. in Final Ver-sion
81	82	89	78	.21	D	-
82	38	51	22	.31	R	66
83	19	24	16	.13	D	-
84	25	34	14	.27	R	88
85	55	62	46	.16	D	-
86	46	73	26	.47	R	45
87	31	42	26	.18	D	-
88	50	62	38	.25	R	33
89	72	78	65	.16	D	-
90	51	65	34	.33	R	26
91	46	54	39	.15	D	-
92	17	22	12	.16	D	-
93	51	66	38	.29	R	25
94	50	70	31	.40	R	32
95	66	75	60	.16	D	-
96	57	70	46	.25	R	13
97	68	78	62	.19	D	-
98	40	54	30	.25	R	61

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
99	18	30	11	.29	D	-
100	47	73	27	.50	R	44
101	38	51	22	.31	R	65
102	41	54	30	.25	R	59
103	56	70	46	.25	R	14
104	45	63	30	.34	R	48
105	46	58	39	.19	D	-
106	45	61	33	.29	R	50
107	18	27	10	.27	D	-
108	81	89	74	.26	D	-
109	18	29	12	.25	D	-
110	46	73	26	.49	R	46
111	18	31	11	.31	D	-
112	68	78	62	.19	D	-
113	35	50	18	.36	R	74
114	39	66	34	.33	R	64
115	31	42	26	.18	D	-
116	76	89	72	.26	R	2

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
117	66	75	60	.18	D	-
118	40	54	30	.25	R	60
119	29	47	12	.42	R	84
120	50	74	34	.41	R	31
121	55	74	42	.33	R	15
122	39	51	30	.21	R	63
123	46	76	27	.50	R	47
124	59	74	46	.31	R	12
125	47	74	26	.48	R	43
126	42	65	23	.45	R	58
127	46	58	37	.17	D	-
128	51	66	34	.33	R	27
129	82	87	79	.12	D	-
130	46	54	39	.15	D	-
131	28	47	12	.42	R	85
132	55	62	46	.16	D	-
133	27	46	11	.44	R	87
134	50	66	38	.29	R	28

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
135	17	29	8	.34	D	-
136	79	90	78	.21	R	1
137	83	88	79	.16	D	-
138	50	67	38	.30	R	29
139	40	56	29	.27	R	62
140	19	32	13	.26	D	-
141	81	89	74	.26	D	-
142	73	87	69	.22	R	3
143	43	66	22	.45	R	57
144	46	54	40	.15	D	-
145	67	79	63	.19	D	-
146	17	22	12	.16	D	-
147	54	73	46	.30	R	16
148	19	32	11	.32	D	-
149	50	68	39	.30	R	30
150	85	89	80	.18	D	-

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
			Test : 3.1(b)			
151	78	88	74	.21	R	91
152	19	29	12	.25	D	-
153	84	89	80	.18	D	-
154	19	30	10	.30	D	-
155	81	89	74	.26	D	-
156	75	86	70	.22	R	92
157	67	75	57	.20	R	95
158	61	84	58	.31	R	94
159	60	74	46	.30	R	93
160	81	92	75	.30	D	-
			Test : 3.1(c)			
161	73	87	65	.29	R	97
162	81	87	75	.18	D	-
163	65	85	62	.31	R	99
164	18	22	12	.16	D	-
165	49	62	39	.26	R	98

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
166	48	63	40	.25	R	96
167	81	87	74	.18	D	-
168	77	85	71	.19	D	-
169	81	89	78	.21	D	-
170	41	57	30	.29	R	100
		Test : 3.2				
171	65	75	56	.22	R	101
172	63	72	51	.24	R	102
173	61	84	58	.31	R	103
174	57	70	46	.25	R	104
175	54	73	42	.33	R	105
176	49	62	39	.24	R	106
177	48	63	40	.23	R	107
178	44	58	38	.20	R	108
179	43	59	30	.29	R	109
180	43	58	32	.28	R	110

Table : 5.3
(Contd.)

PART : III

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
Test : 3.3						
181	16	23	12	.17	D	-
182	50	62	40	.23	R	111
PART : IV						
Test : 4.1(a)						
1	19	23	15	.13	D	-
2	17	22	12	.16	D	-
3	15	22	11	.21	D	-
4	18	24	13	.15	D	-
5	17	24	11	.23	D	-
Test : 4.1(b)						
6	75	86	70	.22	R	1
7	73	87	65	.29	R	2

Table : 5.3
(Contd.)

PART : IV

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
8	73	86	69	.23	R	3
9	65	84	63	.29	R	4
10	63	78	53	.27	R	5
11	81	87	74	.19	D	-
12	72	85	65	.24	R	7
13	65	75	56	.22	R	10
14	63	72	51	.24	R	6
15	63	76	54	.25	R	9
16	58	70	46	.25	R	8
		Test : 4.1(c)				
17	75	85	47	.43	R	11
18	73	84	64	.26	R	12
19	72	86	66	.27	R	13
20	68	86	63	.30	R	14
		Test : 4.2(a)				
21	57	70	46	.25	R	15

Table : 5.3
(Contd.)

PART : IV

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
22	55	74	38	.37	R	16
23					R	17
24					R	18
25					R	19
26					R	20
Test : 4.2(b)						
27	50	62	42	.20	R	21
28					R	22
29					R	23
30					R	24
Test : 4.3(a)						
31	67	75	57	.20	R	25
32	64	76	54	.25	R	26
33	56	68	46	.24	R	27
34	56	70	46	.25	R	28

Table : 5.3
(Contd.)

PART : IV

Item No. in Try-out Version	Difficulty Index (%age Right in the Whole Test)	H Percentage Right in Upper 27%	L Percentage Right in Lower 27%	Discriminatory Validity Index (Biserial 'r')	Retained or Discarded	Item No. in Final Version
Test : 4.3(b)						
35	48	63	39	.26	R	29
36					R	30
37					R	31
38	49	62	39	.24	R	35
39	48	64	40	.26	R	32
40	43	59	32	.28	R	33
41	19	24	13	.16	D	-
42	42	54	32	.23	R	34
43	40	54	30	.25	R	36

The table given above gives the difficulty value of each item. Table 5.4, which follows, gives the frequency distribution of difficulty values of the items retained for the final version.

Table : 5.4

FREQUENCY DISTRIBUTION OF DIFFICULTY VALUES OF ITEMS RETAINED FOR THE FINAL VERSION

Difficulty Value	Frequency
78 - 80	2
75 - 77	10
72 - 74	11
69 - 71	13
66 - 68	15
63 - 65	16
60 - 62	20
57 - 59	23
54 - 56	32
51 - 53	64
48 - 50	50
45 - 47	41
42 - 44	25
39 - 41	22
36 - 38	18
33 - 35	15
30 - 32	10
27 - 29	6
24 - 26	4
20 - 23	5

(i) 64 % of items are between the difficulty value 60 and 40.

(ii) 19 % of items have difficulty value between 61 and 80.

(iii) 17 % of items have difficulty value between 39 and 20.

The following table compares the actual distribution of difficulty indices in the final version with one suggested by Summer.

Table : 5.5

DISTRIBUTION OF DIFFICULTY VALUE IN THE FINAL VERSION AS COMPARED WITH THE CRITERION SET BY SUMMER

No.	SUMMER — Difficulty Indices		Actual Frequency in the Final Version
1	Below 40 'D'	20 %	67 = 17 %
2	Between 41 'D' and 60 'D'	60 %	256 = 64 %
3	Above 60 'D'	20 %	77 = 19 %
Total :		100 %	400 = 100 %

(g) The Range of Discrimination

After having decided the range of difficulty indices within which an item might become acceptable for the final test, the next question the investigator was faced with was to apply the second criterion, that is that of discriminative value. The question was that of deciding the range of discrimination indices.

There is naturally no need for deciding the upper limit. If an item has 1. discrimination power, theoretically it would be the best item, other things being equal. But an item below a certain minimum level of discrimination power will not do. So the question was that of deciding the minimum discrimination index. According to Thorndike (1961), an item with a validity index as high as .25 usually represents an outstandingly valid item. Garrett (1962) believes that items with a validity index of .20 or more can be regarded as satisfactory. While according to Davis (Lindquist ed. 1951), in the case of a predictor test, if item-analysis data are available with the total score on all the items, some items having discrimination value even less than .20 might also be selected.

Table 5.3, given above on Pages 138 to 174, shows the discrimination indices of each of the 584 items of

the try-out version. Table 5.6 given below, shows the frequency distribution of the discrimination indices of the 400 items selected for the final version.

Table : 5.6

FREQUENCY DISTRIBUTION OF DISCRIMINATION INDICES OF ITEMS RETAINED FOR THE FINAL TEST

Discrimination Indices	Frequency
.20 to .24	89
.25 to .29	156
.30 to .34	92
.35 to .39	22
.40 to .44	23
.45 to .49	14
.50 to .54	4
Total =	400

The table shows that 16 % of items have discrimination value of .35 or higher. Items having the discrimination value between .25 and .34 are 248 = 62 %. Items having discrimination value lower than .25 are only 89, i.e. 22 %.

No item below the discrimination value of .20 was retained.

It can thus be concluded that the selection includes high percent of outstanding valid items, that is items having validity coefficient higher than .19. It can also be said that the criterion was strict enough to bring out a satisfactory selection of items.

Analysis of non-functioning and reverse-functioning distractors ought to be done to make item analysis complete, but due to the large number of items in the test and wide sample, that has not been attempted.

(h) The Outcomes of the Try-out

The try-out, thus, revealed useful information concerning:

(1) mechanics of test taking,

(2) difficulty and discriminating power of individual items, and

(3) time requirement.

As a result of item-analysis:

a. Special hints were gained regarding:

Test 2.2 : Orderly arrangement of jumbled sentences.

Test 4.1 : Reading comprehension.

b. The following change occured in the size of tests:

Test	Items in Try-out	Items Discarded	Items retained for Final Version
I	253	73	180
II	106	33	73
III	182	71	111
IV	43	7	36
	584	184	400

c. Items having difficulty value lower than .20 and higher than .80 were discarded. In the same way items having discrimination index lower than .20 were discarded.

d. In the final version, items are arranged according to the ascending order of difficulty in each sub-test. The standard of ascending difficulty is observed sub-test-wise, not for the whole test as such.

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