**Item Analysis of a MCQs Paper**

**Subject: Measurement & Evaluation**

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**Institute of Education & Research**

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**Definition of Item Analysis**

“Item Analysis is a process which examines student responses to individual test items (questions) in order to assess the quality of those items and of the test as a whole”.

“It is the process in which we analyze the responses of students to each item in the test”.

Item Analysis can be a powerful technique available to instructors for the guidance and importance of instruction.

**Purpose of Item Analysis**

It serves three main purposes:

* It contains information that serves as a basis for improving the test items.
* It provides data for class discussion of the test.
* It helps in diagnosing the strengths and weaknesses of the students in learning the course material covered by the test.

Item Analysis answers at least three questions about each test item i.e.

**1. Item difficulty level**

This technique is used to know that whether the test items are according to the mental level of the students or not.

**2. Discrimination power of the test items**

It means to know that:

* Whether items discriminate between the high scoring and the low scoring students?
* Whether our test items show the qualities and initiatives of the students.
* Do these items show the individual differences of the students?

**3. Effectiveness of Distractors:**

To know how effective is each distractor in the item (in case of MCQs only)?

**Importance of Item Analysis:**

* It provides basis for class room work i.e. to know the cause of misunderstanding between teacher and student.
* It also provide base for remedial work i.e. for the re-teaching of a previous topic.
* It can improve the class room instructions or teaching procedure of the teacher.
* It will improve the skill of test construction of a teacher and if there is any difficulty or mistake in the test, the teacher can exclude that item from the test which improves the teaching learning process.

**Procedure for Item Analysis**

A step-by-step procedure of item analysis is given as under:

**Step-1**

After scoring the test, the test papers should be arranged in order from the highest score to the low score.

**Step-2**

27% or about one-fourth (1/4) of the papers with the highest score should be selected which will be called as the Highest Scoring Group (H.S.G). Similarly, the same number of papers with the lowest score is selected and will be called as Low Scoring Group (L.S.G). The middle group of paper is not needed to be included in item analysis.

**Step-3**

The responses of students of both high and low scoring groups should be tabulated on each test item. This tabulation simply tells whether a student gives the answer correct (C)or incorrect (I) an item.

**Step-4**

Item analysis working sheet should be prepared using the following procedure:  
 First, the number of each item is listed in the first column of the table, headed “Item Number”.

Second, the number of students should be counted in the high-scoring group who got each item right and the numbers are entered in the second column of the table, headed “H”.

Third, the number of students in the low-scoring should be counted who got each item right and should be entered the numbers in the third column of the table, headed “L”.

Fourth, the number of high-scoring group who got the item right is added with the number of low-scoring group who got the item right and the total should be entered in the fourth column of the table, headed “H + L”. This information will be used in determining item difficulty.

Fifth, the number of the low-scoring group who got the item right should be subtracted from the number of high-scoring group who got the item right and differences should be entered in the fifth column of the table, headed “H - L”. This information will be used in determining item discrimination.

**Step-5**

The item difficulty level is then determined and interpreted. The difficulty of an item is defined as ‘the percentage of students who got the item right’. The item difficulty level can be determined with the formula:

P = H+L x(100)

N

P = Index of item difficulty

H = Number of students in the high-scoring group who got the item right

L = Number of students in the low-scoring group who got the item right

N = Total number of students, that is, the students in the high-scoring group plus

the students in the low-scoring group

If difficulty level P = 100%, it means that all students got the item right and the item is very easy. But if it is 0% (P = 0%), it means that no student got the item correct and the item is very difficult.

The purpose of a general achievement test is to rank the students according to the mastery of the subject matter taught, it is essential that a test must contain items of varying difficulty. The items of 100% or 0% difficulty fail to rank the students and hence they ought to be discarded from the test. It is, however, advisable to keep one or two very easy items in the beginning of the test so that the students are motivated to attempt the test. In the light of the results of item analysis, the teacher can make the test conform to the desired level of difficulty by including easier or more difficult items.

**Step-6**

The item discrimination index is determined and interpreted. The discriminating power of a test item is its ability to differentiate between good (high-scoring) and poor (low-scoring) students. The following formula, for this purpose, is used:

D = H – L

N/2

N = Index of discrimination

H = Number of students in the high-scoring group who got the item right

L = Number of students in the low-scoring group who got the item right

N = Total number of students, that is, the students in the high-scoring group plus

the students in the low-scoring group

The index of item discrimination may vary from +1.00 through 0.00 to –1.00. The maximum size of the index of item discrimination is +1.00. This situation occurs when all the students in the high-scoring group get the item right and all the students in the low-scoring group get the item get the item wrong.

The minimum size of the index of item discrimination is –1.00. This situation occurs when the discrimination is in the wrong direction, that is, when all the students in the high-scoring group get the item wrong while all the students in the low-scoring group get the item right. This is very unusual situation.

The index of item discrimination is zero when no students from high or low-scoring group answer the item correctly, or all of them answer the item correctly. From discrimination point of view such items are simply worthless. The item discrimination index is ideal if it is not below +0.20.

**Step-7**

At last, distractors are studied. In multiple choice items, the distractors should neither be too attractive nor excessively unattractive. The appropriateness of a distractor may be determined by an inspectional method.

Those distracters which attract both the groups equally are considered as “suspect” and needs improvement. The distracters which attract Low Scoring Group (LSG) more than the High Scoring (HSG) are considered as “effective”. The distracters which attract High Scoring Group (HSG) more than the Low Scoring Group (LSG) are considered as “negative” and should be discarded. The fourth category is that in which there is no attraction for both sides (HSG and LSG) are considered as ineffective and should be replaced.

**Procedure adopted for Item Analysis**

**Step – 1:-** First of all a test including 30 items from the Urdu textbook of 9th class was prepared and then administered among 40 students of 9th class. After scoring the test, the papers were arranged from highest to lowest scores.

**Step – 2:-** One-fourth (27%) from the top high scoring group (H) and one-fourth (27%) from the bottom low scoring group were selected.

**Step – 3:-** Then the tabulation sheet was prepared (Table-1). The tabulation sheet showed correct (c) and incorrect (I) answers from students.

**Step – 4:-**.The Item Analysis working sheet was also prepared (Table-2).

**Step – 5:-** The item difficulty level of all items was calculated with the formula and then interpreted (Table-3).

**Step – 6:-** The index of discrimination of all items was calculated with the help of formula and then interpreted Table-4)

**Step – 7:-** Distracters were also tabulated and studied (Table-5 &6).

The details of the whole procedure are given in the next pages:

**Table – 1**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item Analysis Tabulation Sheet** | | | | | | | | | | | | | | | |  |  |  |  |  |  |
| **(Showing responses of 20 students to 30 items)** | | | | | | | | | | | | | | | | C | = | Correct | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  | I | = | Incorrect | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  | H | = | High Scoring Group | | | |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  | L | = | Low Scoring Group | | | |
| **High Scoring Group (H)** | | | | | | | | | | | **Low Scoring Group (L)** | | | | | | | | | | |
| **Item No.** | **A** | **B** | **C** | **D** | **E** | **F** | **G** | **H** | **I** | **J** | **K** | **L** | | **M** | **N** | **O** | **P** | **Q** | **R** | **S** | **T** |
| 1 | C | C | C | C | C | C | C | C | C | C | C | C | | C | C | C | C | C | C | C | C |
| 2 | C | C | C | C | C | C | I | C | C | C | C | C | | I | C | C | I | C | C | I | I |
| 3 | C | C | C | C | C | C | C | C | C | C | I | C | | C | C | C | I | I | C | I | I |
| 4 | C | I | C | C | I | I | I | C | I | C | C | I | | I | C | C | C | C | I | I | I |
| 5 | C | C | C | C | C | C | C | C | C | C | C | C | | C | C | C | C | C | C | C | C |
| 6 | C | C | C | C | C | C | C | C | C | C | C | I | | C | C | I | I | C | C | C | C |
| 7 | C | C | C | C | C | C | C | C | C | C | I | C | | I | I | I | I | I | I | C | C |
| 8 | C | C | C | C | C | C | C | C | C | C | C | C | | C | I | C | C | I | C | C | I |
| 9 | C | C | C | I | C | C | C | C | C | C | C | I | | I | C | I | I | C | C | C | I |
| 10 | C | I | C | C | I | C | C | C | C | C | I | I | | I | I | C | I | I | I | I | I |
| 11 | C | C | C | C | C | C | C | C | C | C | C | C | | C | C | I | C | C | I | I | I |
| 12 | C | C | C | C | C | C | C | C | C | C | C | C | | I | C | C | C | C | I | C | I |
| 13 | C | C | C | C | C | C | C | C | C | C | C | C | | C | C | I | C | I | I | C | I |
| 14 | C | C | C | C | C | C | I | C | C | C | C | C | | C | C | C | C | C | I | C | C |
| 15 | C | C | I | C | I | C | C | C | C | I | I | I | | C | C | I | C | C | I | C | I |
| 16 | I | C | I | I | I | I | C | I | I | C | I | I | | I | C | I | I | I | I | C | I |
| 17 | C | C | C | I | C | I | C | I | C | I | C | C | | I | C | C | I | I | C | I | C |
| 18 | C | C | C | C | C | C | C | C | C | C | C | I | | C | I | C | I | I | C | C | I |
| 19 | C | C | C | C | C | C | I | C | C | I | C | C | | C | I | I | C | I | C | I | I |
| 20 | C | C | C | C | C | C | C | C | C | C | I | C | | C | C | C | I | C | C | I | I |
| 21 | C | C | C | C | C | C | C | C | C | C | C | C | | C | I | C | C | I | I | I | C |
| 22 | C | C | C | C | C | C | C | C | C | C | I | C | | I | C | I | I | I | I | I | I |
| 23 | C | C | C | C | C | C | C | C | I | C | C | I | | I | C | C | C | C | I | I | I |
| 24 | C | C | C | C | C | C | C | C | I | C | C | I | | C | C | I | C | C | C | I | I |
| 25 | C | C | C | C | C | C | C | C | C | C | I | I | | I | C | C | C | I | C | C | C |
| 26 | C | C | C | C | C | C | C | C | C | C | C | I | | C | C | C | C | C | C | I | C |
| 27 | C | C | C | C | C | C | C | C | C | C | C | I | | C | C | C | C | C | C | C | C |
| 28 | C | C | C | C | C | C | C | C | C | C | C | C | | I | C | C | C | C | C | C | C |
| 29 | C | C | I | C | C | I | C | C | C | I | I | C | | C | I | I | C | C | C | I | I |
| 30 | C | C | C | C | C | C | C | C | C | C | C | C | | C | C | C | C | C | I | C | C |

**Table – 2**

**Item Analysis Working Sheet**

**(Data from Table – 1 organized for computing item difficulty and item discrimination)**

H = Number of students in the high-scoring group who got the item right.

L = Number of students in the low-scoring group who got the item right.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Item No.** | **H** | **L** | **H+L** | **H-L** |
| 1 | 10 | 10 | 20 | 0 |
| 2 | 9 | 6 | 15 | 3 |
| 3 | 10 | 5 | 15 | 5 |
| 4 | 5 | 5 | 10 | 0 |
| 5 | 10 | 10 | 20 | 0 |
| 6 | 10 | 7 | 17 | 3 |
| 7 | 10 | 4 | 14 | 6 |
| 8 | 10 | 7 | 17 | 3 |
| 9 | 9 | 5 | 14 | 4 |
| 10 | 8 | 1 | 9 | 7 |
| 11 | 10 | 6 | 16 | 4 |
| 12 | 10 | 7 | 17 | 3 |
| 13 | 10 | 6 | 16 | 4 |
| 14 | 9 | 9 | 18 | 0 |
| 15 | 7 | 5 | 12 | 2 |
| 16 | 3 | 2 | 5 | 1 |
| 17 | 6 | 5 | 11 | 1 |
| 18 | 10 | 5 | 15 | 5 |
| 19 | 8 | 5 | 13 | 3 |
| 20 | 10 | 7 | 17 | 3 |
| 21 | 10 | 6 | 16 | 4 |
| 22 | 10 | 2 | 12 | 8 |
| 23 | 9 | 5 | 14 | 4 |
| 24 | 9 | 6 | 15 | 3 |
| 25 | 10 | 6 | 16 | 4 |
| 26 | 10 | 8 | 18 | 2 |
| 27 | 10 | 9 | 19 | 1 |
| 28 | 10 | 9 | 19 | 1 |
| 29 | 7 | 5 | 12 | 2 |
| 30 | 10 | 9 | 19 | 1 |

**Table – 3**

0% means items are difficult

100% means items are very easy

**Item Difficulty Level**

**(Percentage of the students who got the item right)**

**Formula is P =H+L/Nx100**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item No.** | **H** | **L** | **H+L** | **P = H+L/Nx100** | **Item Difficulty** |
| 1 | 10 | 10 | 20 | 100% | Very Easy |
| 2 | 9 | 6 | 15 | 75% | - |
| 3 | 10 | 5 | 15 | 75% | - |
| 4 | 5 | 5 | 10 | 50% | - |
| 5 | 10 | 10 | 20 | 100% | Very Easy |
| 6 | 10 | 7 | 17 | 85% | - |
| 7 | 10 | 4 | 14 | 70% | - |
| 8 | 10 | 7 | 17 | 85% | - |
| 9 | 9 | 5 | 14 | 70% | - |
| 10 | 8 | 1 | 9 | 45% | - |
| 11 | 10 | 6 | 16 | 80% | - |
| 12 | 10 | 7 | 17 | 85% | - |
| 13 | 10 | 6 | 16 | 80% | - |
| 14 | 9 | 9 | 18 | 90% | - |
| 15 | 7 | 5 | 12 | 60% | - |
| 16 | 3 | 2 | 5 | 25% | - |
| 17 | 6 | 5 | 11 | 55% | - |
| 18 | 10 | 5 | 15 | 75% | - |
| 19 | 8 | 5 | 13 | 65% | - |
| 20 | 10 | 7 | 17 | 85% | - |
| 21 | 10 | 6 | 16 | 80% | - |
| 22 | 10 | 2 | 12 | 60% | - |
| 23 | 9 | 5 | 14 | 70% | - |
| 24 | 9 | 6 | 15 | 75% | - |
| 25 | 10 | 6 | 16 | 80% | - |
| 26 | 10 | 8 | 18 | 90% | - |
| 27 | 10 | 9 | 19 | 95% | - |
| 28 | 10 | 9 | 19 | 95% | - |
| 29 | 7 | 5 | 12 | 60% | - |
| 30 | 10 | 9 | 19 | 95% | - |

**Interpretation**

Items No. 1 & 5 has 100% difficulty level which means that these are very easy and need to be replaced. However it should be noted that one or two very easy items should be kept in the beginning of the test so that the students are motivated to attempt the test. So only item No.5 is replaceable. There is no 0% difficulty which means that there is no item very difficult in test.

**Table – 4**

It should be +1.00 – 0.00 – 1.00

O means all or no student from either side answer the item correctly

**Item Discrimination Level (D)**

**The Formula is D = H-L/N/2**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item No.** | **H** | **L** | **H-L** | **D = H-L/N/2** | **Remarks** |
| 1 | 10 | 10 | 0 | 0 | 0 index of discrimination |
| 2 | 9 | 6 | 3 | 0.3 | - |
| 3 | 10 | 5 | 5 | 0.5 | - |
| 4 | 5 | 5 | 0 | 0 | 0 index of discrimination |
| 5 | 10 | 10 | 0 | 0 | 0 index of discrimination |
| 6 | 10 | 7 | 3 | 0.3 | - |
| 7 | 10 | 4 | 6 | 0.6 | - |
| 8 | 10 | 7 | 3 | 0.3 | - |
| 9 | 9 | 5 | 4 | 0.4 | - |
| 10 | 8 | 1 | 7 | 0.7 | - |
| 11 | 10 | 6 | 4 | 0.4 | - |
| 12 | 10 | 7 | 3 | 0.3 | - |
| 13 | 10 | 6 | 4 | 0.4 | - |
| 14 | 9 | 9 | 0 | 0 | 0 index of discrimination |
| 15 | 7 | 5 | 2 | 0.2 | - |
| 16 | 3 | 2 | 1 | 0.1 | - |
| 17 | 6 | 5 | 1 | 0.1 | - |
| 18 | 10 | 5 | 5 | 0.5 | - |
| 19 | 8 | 5 | 3 | 0.3 | - |
| 20 | 10 | 7 | 3 | 0.3 | - |
| 21 | 10 | 6 | 4 | 0.4 | - |
| 22 | 10 | 2 | 8 | 0.8 | - |
| 23 | 9 | 5 | 4 | 0.4 | - |
| 24 | 9 | 6 | 3 | 0.3 | - |
| 25 | 10 | 6 | 4 | 0.4 | - |
| 26 | 10 | 8 | 2 | 0.2 | - |
| 27 | 10 | 9 | 1 | 0.1 | - |
| 28 | 10 | 9 | 1 | 0.1 | - |
| 29 | 7 | 5 | 2 | 0.2 | - |
| 30 | 10 | 9 | 1 | 0.1 | - |

**Interpretation**

Items No. 1,4,5 and 14 have zero index of discrimination which means that either all or no student from both high and low-scoring groups have answered these item correctly. These should be improved or replaced.

**Table – 5**

**Item Analysis chart for studying Distracters in multiple choice items**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item No.** | **Group** | **Group size** | **Response Alternatives** | | | | | **Remarks regarding distractors** | | | | | | |
| **a** | **b** | **C** | **D** | **Omit** | **Suspect** | **Effective** | | **Negative** | | **Ineffective** | |
| 1 | H.S.G | 10 | 0 | 10 | 0 | 0 | 0 | b |  | |  | | a,c,d | |
| L.S.G | 10 | 0 | 10 | 0 | 0 | 0 |  |  | |  | |  | |
| 2 | H.S.G | 10 | 0 | 0 | 7 | 0 | 3 |  | b,d | | c | |  | |
| L.S.G | 10 | 1 | 1 | 6 | 2 | 0 |  |  | |  | |  | |
| 3 | H.S.G | 10 | 0 | 0 | 8 | 0 | 2 |  | a,b | | c | | d | |
| L.S.G | 10 | 1 | 4 | 5 | 0 | 0 |  |  | |  | |  | |
| 4 | H.S.G | 10 | 0 | 4 | 0 | 3 | 3 | b | a,d | |  | | c | |
| L.S.G | 10 | 1 | 4 | 0 | 4 | 1 |  |  | |  | |  | |
| 5 | H.S.G | 10 | 0 | 10 | 0 | 0 | 0 | b |  | |  | | a,c,d | |
| L.S.G | 10 | 0 | 10 | 0 | 0 | 0 |  |  | |  | |  | |
| 6 | H.S.G | 10 | 0 | 0 | 0 | 10 | 0 |  | b,c | | d | | a | |
| L.S.G | 10 | 0 | 2 | 1 | 7 | 0 |  |  | |  | |  | |
| 7 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | b,c | | a | | d | |
| L.S.G | 10 | 4 | 4 | 1 | 0 | 1 |  |  | |  | |  | |
| 8 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | b,c | | a | | d | |
| L.S.G | 10 | 7 | 2 | 1 | 0 | 0 |  |  | |  | |  | |
| 9 | H.S.G | 10 | 0 | 1 | 9 | 0 | 0 |  | a,d | | c | |  | |
| L.S.G | 10 | 3 | 0 | 5 | 1 | 1 |  |  | |  | |  | |
| 10 | H.S.G | 10 | 8 | 0 | 0 | 2 | 0 |  | b,d | | a | | c | |
| L.S.G | 10 | 1 | 4 | 0 | 3 | 2 |  |  | |  | |  | |
| 11 | H.S.G | 10 | 0 | 0 | 0 | 10 | 0 |  | b,c | | d | | a | |
| L.S.G | 10 | 0 | 1 | 1 | 6 | 2 |  |  | |  | |  | |
| 12 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | c | | a | | b,d | |
| L.S.G | 10 | 7 | 0 | 1 | 0 | 2 |  |  | |  | |  | |
| 13 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | c,d | | a | | b | |
| L.S.G | 10 | 6 | 0 | 2 | 2 | 0 |  |  | |  | |  | |
| 14 | H.S.G | 10 | 0 | 9 | 1 | 0 | 0 | b |  | |  | | a,d | |
| L.S.G | 10 | 0 | 9 | 1 | 0 | 0 |  |  | |  | |  | |
| 15 | H.S.G | 10 | 4 | 2 | 1 | 3 | 0 |  | c | | a,d | |  | |
| L.S.G | 10 | 3 | 2 | 2 | 1 | 2 |  |  | |  | |  | |
| 16 | H.S.G | 10 | 3 | 2 | 3 | 2 | 0 | b | a | | c,d | |  | |
| L.S.G | 10 | 4 | 2 | 2 | 1 | 1 |  |  | |  | |  | |
| 17 | H.S.G | 10 | 5 | 1 | 3 | 1 | 0 |  | b | | c | |  | |
| L.S.G | 10 | 4 | 2 | 1 | 1 | 2 |  |  | |  | |  | |
| 18 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | b,c | | a | | d | |
| L.S.G | 10 | 5 | 3 | 1 | 0 | 1 |  |  | |  | |  | |
| 19 | H.S.G | 10 | 7 | 2 | 1 | 0 | 0 | b | d | | a,c | |  | |
| L.S.G | 10 | 4 | 2 | 0 | 2 | 2 |  |  | |  | |  | |
| 20 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | c | | a | | b,d | |
| L.S.G | 10 | 2 | 0 | 6 | 0 | 2 |  |  | |  | |  | |
| 21 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | b,c,d | | a | |  | |
| L.S.G | 10 | 5 | 1 | 1 | 1 | 2 |  |  | |  | |  | |
| 22 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | | b,c,d | | a | |  |
| L.S.G | 10 | 3 | 1 | 5 | 1 | 0 |  | |  | |  | |  |
| 23 | H.S.G | 10 | 1 | 9 | 0 | 0 | 0 |  | | a | | b | | c,d |
| L.S.G | 10 | 3 | 7 | 0 | 0 | 0 |  | |  | |  | |  |
| 24 | H.S.G | 10 | 1 | 9 | 0 | 0 | 0 |  | | a | | b | | c,d |
| L.S.G | 10 | 3 | 7 | 0 | 0 | 0 |  | |  | |  | |  |
| 25 | H.S.G | 10 | 0 | 10 | 0 | 0 | 0 |  | | a | | b | | c,d |
| L.S.G | 10 | 3 | 7 | 0 | 0 | 0 |  | |  | |  | |  |
| 26 | H.S.G | 10 | 0 | 10 | 0 | 0 | 0 |  | | a | | b | | c,d |
| L.S.G | 10 | 1 | 8 | 0 | 0 | 1 |  | |  | |  | |  |
| 27 | H.S.G | 10 | 0 | 0 | 10 | 0 | 0 |  | |  | | c | | a,b,d |
| L.S.G | 10 | 0 | 0 | 9 | 0 | 1 |  | |  | |  | |  |
| 28 | H.S.G | 10 | 10 | 0 | 0 | 0 | 0 |  | | b | | a | | c,d |
| L.S.G | 10 | 9 | 1 | 0 | 0 | 0 |  | |  | |  | |  |
| 29 | H.S.G | 10 | 7 | 3 | 0 | 0 | 0 | b | | c | | a | | d |
| L.S.G | 10 | 5 | 3 | 2 | 0 | 0 |  | |  | |  | |  |
| 30 | H.S.G | 10 | 0 | 10 | 0 | 0 | 0 |  | | c | |  | | a,d |
| L.S.G | 10 | 0 | 1 | 9 | 0 | 0 |  | |  | | b | |  |
| **Total** | | | | | | | | **8** | | **41** | | **29** | | **37** |

**Interpretation**

Those distracters which attracted both the groups equally are considered as ***“suspect”*** and needs improvement **(8 nos.)**. The distracters which attracted Low Scoring Group (LSG) more than the High Scoring (HSG) are considered as ***“effective”*** **(41 nos.)**. The distracters which attracted High Scoring Group (HSG) more than the Low Scoring Group (LSG) are considered as ***“negative”*** **(29 nos.)** and should be discarded. The fourth category is that in which there is no attraction for both sides (HSG and LSG), are considered as ***“ineffective”*** **(37 nos.)** and should be replaced.

**Conclusion**

The analysis of students’ responses to each item on the test is called item analysis. Item analysis data are useful in improving the test, in serving as a basis for class discussion in diagnosing the students’ strengths and weaknesses and increasing the skill of item construction. Item analysis deals with item difficulty, item discrimination and effectiveness of distractors.

The difficulty of an item is defined as the percentage of students’ passing. This was calculated with the help of formula and difficult items were identified.

The discriminating power of a test item is its ability to differentiate between good and poor students. This was also calculated with help of formula and 0% discrimination index of items were suggested to be improved.

The effectiveness of distractors in a multiple-choice item is determined by inspection. Ineffective distractors were identified and suggested to be improved.