## CHAPTER I

## INTRODUCTION

This chapter consists of background, coverage, and place of conducting the try-out.

## A. Background

A test is a measuring device for assessing the achievement of the objectives in a training system which is a set of questions for which there is an accepted set of correct answers. This is not as easy as what one thinks because it needs certain aspects of doing training system such as preparation, implementation or simulation, accuracy and correctness, and evaluation. Bachman and Palmer (1996) in Alderson (2000) stated that a test development seems to have three components namely design, operationalisation, and administration. A good tester should aware of these aspects in order to achieve the objectives of the test.

Some testers are still shuffling a test up. The test is likely done as an administrative obligation without resting on what a test is done for. They tend to assume that a test is just for determining students success or fail in achieving the standard of certain competencies. In fact that a test is not merely an obedient servant to the teaching like what Davies said (1968). It seems to be too administratively in the teaching and learning matter and it is not likely a good evaluation in the teaching and learning process. Jabu (2008) said that there are such informations such as validity; the purpose of the test, difficulty; the characteristics of the examinees, reliability; the accuracy of measurement,
applicability; the suitability of format and features of the test, replicability; the development sample relevance, the availability of equivalent of equated forms, interpretability; the nature of the scoring and reporting of scores, the cost of test procurement, economy; administration and testing, availability; the procurement of test, acceptability; the political consideration, and discriminability; the power of the test.

Again, a test is used to eveluate the achievement of learning and or teaching concerns with language learning in order to know and understand what teacher and students have got so far. This paper, therefore, provides the detail of how an evaluation is conducted after doing the test.

## B. Coverage

This test is designed in some sections namely Listening Section, Reading Section, Grammar Section, and Vocabulary Section. Each section has various numbers of question which is the Listening Section that consists of ten numbers, Reading Section consists of twelve numbers, Grammar Section consists of fifteen numbers, and Vocabulary Section consists of thirteen numbers. So, all section equals fifty numbers which is Grammar Section is all the much among sections in this test design.

The Listening Section is a self-made which is recorded by the tester himself that consists of Part A, B, and C. Part A consists of six questions, Part B consists of two questions, and Part C consists of two questions. The Reading Section consists of twelve questions which cover four texts in it. The Grammar Section consists of fifteen questions. The last section is Vocabulary Section that consists
of four parts. Part One consists of three questions, Part Twoo consists of four questions, Part Three consists of three questions, and there are three questions for Part Four.

This test is designed to pinpoint the strengths and weaknesses of the students' abilities concern with the four sections of the test. Basically, the purpose of this test is for diagnosing, attaining feedback, and doing evaluation all at once. Before going further to the test items, it is better to make the test specification that provides the official statement about what the tests are and the content of its specification. Test specification is the part of test construction procedures and as the blueprint that will be followed by test/item writer. After making the test, the tester then administered it to the testees. Further, the results of the test were analyzed by presenting the Frequency Distribution, the Mean Score and the Standard Deviation, the Realiability, the Validity, the Difficulty Level and Discrimination Power, and the last is the Distractor Power.

## C. Place of Conducting the Try-out

The place where the Try-out cunducted was at SMP Negeri 1 Pallangga, Jl. Pembangunan No. 3, Kec. Pallangga, Gowa. There were 30 testees who involved in this Try-out of the test who were from the second semester students of the nineth class (IX.3) in academic year 2013/2014. The test was conducted on Monday, November $11^{\text {th }} 2013$.

## CHAPTER II

## TEST SPECIFICATION

This chapter consists of test blueprint, constructed test, answer key, and scoring rubrics of the test.

## A. Test Blueprint

```
Subject : English
Semester/Class : Second/IX. }
School : SMP Negeri 1 Pallangga
Test Technique : Multiple Choice
Test Type : Written Test
```

Test Description : Listening, Reading, Grammar, and Vocabulary

| NO | Basic <br> Competence | Objective/ <br> Indicators | Domain | Type of the <br> Question | Number of <br> Items |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | Listening | The students are able to <br> listen carefully to the <br> monologs and <br> conversations that they <br> hear and answer the <br> questions correctly based <br> on the monologs and <br> conversations that they <br> have heard. | Cognitive | Specific and <br> explicit <br> information | 10 |
| $\mathbf{2}$ | Reading | The students are able to <br> comprehend the texts <br> given, get the information <br> from the texts, and answer <br> the questions correctly by <br> chosing the appropriate <br> options. | Cognitive | Main ideas | 12 |
| $\mathbf{3}$ | Grammar | The students are able to <br> complete the sentences <br> given by considering the <br> appropriate grammar <br> usage. | Cognitive | Grammar | 15 |
| $\mathbf{4}$ | Vocabulary | usages | The students are able to <br> complete the sentences <br> given by chosing the <br> appropriate words or <br> phrases given on the <br> options. | Cognitive | Appropriate <br> words or <br> phrases |

## B. Constructed Test

Almost questions are made by the tester himself and some are from some sources that then rearranged into a complete test which consists of four sections. They are Listening Section, Reading Section, Grammar Section, and Vocabulary Section. The test is then presented as follow:

## LISTENING SECTION

In this section of the test, you will hear a monologue and dialogues.

## Part A

In this part of the section, you will hear a monologue about self introduction then put a Cross ( $\mathbf{X}$ ) on the correct option. Please listen carefully to the monologue you will be hearing then answer the questions because you are not allowed to hear the monologue for the second time.

Please check the questions from number 1 to 6 before listening to the monologue.
Please answer the question 1 to 6 while you are listening.

## Monolog transcription:

"Hello, good morning. I'm a new comer in this class so it's better to introduce myself to you all. Well, my full name is Fernandes Arung, F-E-R-N-A-N-D-E-S space A-R-U-N-G but you can call me Fernandes. Arung is my family name and most of my friends call me Nandes, it's my short name. I used to study at SMA Negeri 1 Bau-bau and my English teacher's name is Mr Wahid. I move to SMA Negeri 1 Palangga because my father has been assigned here and because he is an army. I have a young brother and three sisters. I think that's all and thank you".

1. The speaker is a $\qquad$ .
A. New English teacher
B. New student
C. New army
D. New lecturer
2. What is his first name?
A. Fernandes
B. Nandes
C. Arung

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## D. Wahid

3. What is his surename name?
A. Nandes
B. Wahid
C. Fernandes
D. Arung
4. Where did he study before?
A. He studied at SMA Negeri 2 Bau-bau
B. He used to studied at SMA Negeri 1 Bau-bau
C. He studied at SMA Negeri 1 Palangga
D. He studied at SMA Negeri 1 Bau-bau
5. What is his father's job?
A. He is a teacher
B. He is a student
C. He is a soldier
D. He is an English teacher
6. How many sisters does he has?
A. He has three sisters
B. He has a sister
C. He has two sisters
D. He has three sister

## Part B

In this part of the section, you will hear a conversation between a man and a woman about the time schedule then put a Cross ( $\mathbf{X}$ ) on the correct option. Please listen carefully to the conversation you will be hearing then answer the questions because you are not allowed to hear the conversation for the second time.

Please check the questions from number 7 to 8 before listening to the conversation.

## Dialogue transcription:

| Man | $:$ Hi, Riska. What time is it now? |
| :--- | :--- |
| Woman | $:$ Hmm... it is 9.30 . What's up? |
| Man | : Oh, God. Don't you remeber that we will have a meeting today? |
| Woman | : Yes, but it will be at 10.30. |
| Man | : Oh, sorry. |

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7. What happened to the man?
A. He forgets to attend the meeting
B. He does not know that it is already 9.30
C. He forgets the time of the meeting
D. He does not know the time of the meeting
8. What time actually will the meeting be held?
A. It will be at 10.30
B. It will be at 10
C. It will be at 9.30
D. It will be at 9

## Part C

In this part of the section, you will hear conversations between a woman and a man then put a Cross ( $\mathbf{X}$ ) on the correct option. Please listen carefully to the conversations you will be hearing then answer the questions because you are not allowed to hear the conversations for the second time.

Please check the questions from number 9 to 10 before listening to the conversation.

Dialogue transcription:
Woman : How was your holiday?
Man : It's super!
9. What does the man express?
A. Annoyance
B. Dissatisfaction
C. Satisfaction
D. Anger

Woman : Would you like to give me a ride after class?
Man : Yes, sure.
10. What does the woman express?
A. Asking for permision
B. Granting a request
C. Asking for opinion
D. Asking for a request

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## READING SECTION

## Text 1

Read the invitation below and answer question 1 and 2 by giving a Cross ( $\boldsymbol{X}$ ).

Please join us for party dinner<br>To celebrate<br>RIKA'S THIRTEENTH BIRTHDAY<br>On Saturday, April $20^{\text {th }}, 2008$ at $07.00-10.00$ p.m<br>In the Etam Restaurant<br>Please arrive on time!

1. How old will Rika be in 2014 ?
A. Eighteen
B. Nineteen
C. Ninety
D. Seventy
2. When will the party be held?
A. In the evening
B. In the morning
C. At midnight
D. At noon

## Text 2

Read the following notice then answer question 3 by giving a Cross ( $\boldsymbol{X}$ ).

## "PASSING THROUGH THE RED LIGHT IS VERY DANGEROUS"

3. What is the notice about?
A. To stop when the light turns red
B. To keep driving when the light turns red
C. To be careful on the street
D. To stop when the light turns yellow

## Text 3

Read the following text and answer question 4 and 5 by giving a Cross $(\boldsymbol{X})$.

## ANNOUNCEMENT

To All students of SMPN 1 Palangga
In the framework of National Education Day the Students Organization will hold some interesting programs. They are English Speech Contest and Class Wall Magazine Competition. The program will be held on May $2^{\text {th }} 2013$, started from 8 a.m until 1 p.m.

All classes must take part in the programs.
For detailed information, please contact Mr. Sulaiman, the coordinator of this program
4. What is the announcement above about?
A. The Students Board Organization
B. An English Speech Contest.
C. The National Day Celebration
D. The National Education Day Ceremony
5. Based on the announcement above, these statements are correct, except ....
A. The program will be held on National Educational Day.
B. There will be two competitions.
C. Mr. Sulaiman is in charge to organize the programs
D. The programs will last for four hours.

## Text 4

Read the text below then answer the question 6 to 12 by giving a Cross $(\boldsymbol{X})$.

Long time ago in West Java lived a woman named Dayang Sumbi. She lived alone in a forest. One day, Dayang Sumbi was quilting when suddenly, her quilt fell off from her house. Then she prayed to God. "If a man picks up my quilt, he will be my husband. If a woman, she will be my sister." Then a male dog picks it up. For keeping her words, Dayang Sumbi married the dog and called him Tumang. Dayang Sumbi gave birth to a baby, named him Sangkuriang but never told him who his father was.

One day, Sangkuriang was hunting with Tumang in the forest and he found nothing. He blamed Tumang for the failure and killed him. When Dayang Sumbi knew that, she hit Sangkuriang's head with a big spoon and asked him to go.

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Many years later, the wandering Sangkuriang found a house in the forest, and an old beautiful woman was in the house. The woman, Dayang Sumbi recognized the adventurer as Sangkuriang. Sangkuriang forced her to marry him and Dayang Sumbi asked him to make a vast boat in one night. In the night Sangkuriang called his friends, ghosts, and forest fairies, to help him. Dayang Sumbi feared the boat could be finished on time, so she asked some woman nearby to help her. The woman hit the grain punchers to make noise which disturbed the ghosts and the fairies. The ghosts and the fairies run away before completing the boat. Sangkuriang was very angry. He kicked away the boat upside down, and it turned into a mountain called Tangkuban Perahu. It means the down side boat, which stood in the north Bandung.
6. Who is Dayang Sumbi?
A. Sangkuriang's aunt
B. Sangkuriang's grand mother
C. Sangkuriang's mother
D. Tumang's mother
7. Why did Sangkuriang kick away the boat upside down?
A. He failed to make the boat
B. He wanted to make a mountain from a boat
C. He was disappointed with the ghosts and the fairies
D. He wanted to show his strength to Dayang Sumbi
8. Who is Tumang?
A. Tumang is a dog
B. He is a pet
C. He is Dayang Sumbi's husband
D. He is a hunter
9. The following statements are true, except...
A. Once upon a time there lived a woman named Dayang Sumbi
B. Sangkuriang is Tumang's son
C. Tumang was killed by a tiger
D. Mountain Tangkuban Perahu is in the north Bandung
10. What is the moral value of the story?
A. Do not trust ghosts and fairies
B. Do not blame someone for our failure
C. Tell the truth to avoid something unexpected
D. Do the work patiently without asking for someone's help
11. How long did Dayang Sumbi give chance to Sangkuriang to make a vast boat?
A. A night
B. Three nights

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C. One nights
D. Couple night
12. What does 'Tangkuban Perahu' mean?
A. It means 'stood in the north'
B. It means 'the adventurer'
C. It means 'the down side boat'
D. It means 'turned into a mountain'

## GRAMMAR SECTION

Chose the appropriate option by giving a Cross ( $\boldsymbol{X}$ ).

1. Sinta meets someone at the first time so what should she says to him/her?
A. What's up?
B. How's life?
C. How do you do?
D. How are you?
2. Which sentence can be used in the formal situation, if you want to ask hers/her condition?
A. Good morning, How are you, Dina?
B. What's up?
C. Hallo guys?
D. You good?
3. Our teachers is discussing about new lessons in the meeting room, $\qquad$ are still confuse what the lessons should be given for their Students.
A. They
B. Their
C. He
D. It
4. Andi : Oh my God! I don't know what I can do to do this home work, I think it is so difficult.

Siva : $\qquad$
A. It sounds great
B. Be happy dude...!
C. Can I do for you?
D. Do it now!
5. My father always $\qquad$ up early every day, because he has to work on time, he starts to work at 6.30 and ends at 3.00 .
A. Starts
B. Stands
C. Wakes
D. Gets
6. The teacher punished the students.

He asked $\qquad$ to work outside.
A. Their
B. Them
C. They
D. Him
7. Robert and I are friends, $\qquad$ often go to school together.
A. They
B. Them
C. Our
D. We
8. What day is it?
A. Is it Saturday
B. Saturday
C. It is Saturday
D. This is Saturday
9. There $\qquad$ three birds in front of my house, those birds are eating nuts.
A. Is
B. Was
C. Were
D. Are
10. When I $\qquad$ , my sister was $\qquad$ TV.
A. Came - Watching
B. Come - Watching
C. Comes - Watches
D. Coming - Watching
11. The fish $\qquad$ by a cat yesterday.
A. Was eaten
B. Was eat
C. Is eaten
D. Is eat
12. He has $\qquad$ since last week
A. Going
B. Go
C. Gone
D. Went
13. Whose book is this? That is $\qquad$
A. Ours
B. Mine
C. My
D. Her
14. Is - the - written - being - assignment.

The correct order is
A. Is being the assignment written
B. The written is being assignment
C. The assignment being is written
D. The assignment is being written
15. $\qquad$ always gets up early in the morning.
A. Rina
B. We
C. Rina and I
D. You

## VOCABULARY SECTION

Look at the following advertisement then answer the question 1 to 3 by giving a Cross ( $\boldsymbol{X}$ ).

## White Glamour

For fair and admired skin Indulgent Body Wash

With Vitamin $\mathrm{B}_{2}$ Rose oil, White Tea anti Oxidant

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1. The word "indulgent" is similar to ..
A. Good
B. Very good
C. Bad.
D. Very bad.
2. The word 'fair' is closed to ...
A. Blackish
B. Yellowish
C. Shiny
D. Light
3. The word 'anti' is opposite to ...
A. Pro
B. Back-up
C. Contra
D. Fight

Read the following advertisement then answer the question 4 to 7 by giving $a$ Cross ( X )

## FOR SALE

Two storey houses. It is located near by patrol highway, Jl. Sastrawan No.3, Flores. The house consists of the following:
$\checkmark$ A living room, a drawing room, a dining room, a study room, a kitchen, two bathrooms, and nanny's bedrooms and a garage.
$\checkmark$ Children's and nanny's bedrooms are upstairs and a main bedroom is downstairs.
$\checkmark$ A sofa and some chairs in the drawing room.
$\checkmark$ A refrigerator, an electric fan and a television.
$\checkmark$ Kitchen utensils such as pots, pans, kettles, gas stove, and the kitchen sink.
$\checkmark$ It also has 3000 V power, telephone line, hotspot, and water heater.
$\checkmark$ Serious buyer please contact : Tia (081329075138
4. The phrase 'dining room' means ..
A. A place to sleep
B. A place to sit down
C. A place to watch TV
D. A place to have meal
5. "It is located near by patrol highway, ..."

The underlined word has the opposite of ...
A. Situated
B. Positioned
C. Displaced
D. Sited
6. 'Children's and nanny's bedrooms are upstairs'

The underlined word is similar to ...
A. House keeper
B. Baby sitter
C. Garden cleaner
D. Cleaning service
7. 'It also has 3000 V power'

The stand for V is ...
A. Very
B. Vast
C. Volt
D. Valve

Read the instruction below then answer the question 8 to 10 by giving a Cross ( $\boldsymbol{X}$ ).

| PARAMEX |  |
| :--- | :--- |
|  |  |
| Each tablet contains: |  |
| Propifenason | 250 mg |
| Paracetamol | 1 mg |
| Dekslorfeniramina Maleat | 50 mg |
| Kofeina | $2-3$ daily 1 tablet |
| Dosage: Adults and children over 12: |  |
| Indication: To relieve headaches and toothache. |  |

8. The text above is about ...
A. A recipe
B. A prescription
C. A medicine
D. A lesson
9. 'To relieve headaches and toothache'

The best word to replace the underlined word is ..

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A. Alleviate
B. Omit
C. Increase
D. Heal
10. 'headaches and toothache'

The underlined word is similar to
A. Sick
B. Pain
C. Ill
D. Disease

Chose the best option of the question 11 to 13 by giving a Cross ( $\boldsymbol{X}$ ).
11. They accept our invitation to the party.

The best antonym of the underlined word is ..
A. Receive
B. Cancel
C. Welcome
D. Refuse
12. I am $\qquad$ the sentance on this novel.
The best phrasal verb to fill in the blank is
A. Looking up
B. Looking after
C. Looking at
D. Looking around
13. If you have a motorcycle, please $\qquad$ me after class.
A. Drive
B. Steer
C. Ride
D. Load

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## C. Answer Key

| Listening section | READING SECTION | Grammar section | vocabulary section |
| :---: | :---: | :---: | :---: |
| Part A | Text 1 | 1. C | 1. B |
| 1. B | 1. B | 2. A | 2. D |
| 2. A |  | 3. A | 3. A |
| 3. D | Text 2 | 4. C | 4. D |
| 4. D | 3. A | 5. D | 5. C |
| 5. C | Text 3 | 6. B | 6. B |
| 6. A | 4. D | 7. D | 7. C |
| Part B | 5. D | 8. C | 8. C |
| 7. C | Text 4 | 9. D | 9. A |
| 8. A | 6. C | 10. A | 10. B |
|  | 7. A | 11. A | 11. D |
| Part C | 8. C | 12. C | 12. A |
|  | 9. C | 13. B | 13. C |
|  | 10. C | 14. D |  |
|  | 11. A | 15. A |  |
|  | 12. C |  |  |

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## D. Scoring Rubric of the Test

The raw score obtained from the students' test were scored by using the procedures as follows:

1. Score for correct answer $=1$
2. Score for incorrect answer $=0$
3. Scoring the students' final score by using this formula:

Score

$$
=\frac{\text { Student 's Correct Answer Score }}{\text { The total number of items }} \times 10
$$

## CHAPTER III

## TEST ANALYSIS

This chapter consists of data presentation, mean score and standard deviation, reliability, validity, difficulty level, discrimination power, and distractor power.

## A. Data Presentation (Frequency Distribution)

Table 1. The Data Presentation (Frequency Distribution)

| NO | RAW SCORE | FINAL SCORE | TALLY | FREQUENCY | PERCENTAGE |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | 34 | 68 | $/$ | 1 | 3.3 |
| $\mathbf{2}$ | 25 | 50 | $/ /$ | 2 | 6.66 |
| $\mathbf{3}$ | 24 | 48 | $/ / /$ | 3 | 10 |
| $\mathbf{4}$ | 23 | 46 | $/ / /$ | 3 | 10 |
| $\mathbf{5}$ | 22 | 44 | $/ /$ | 2 | 6.66 |
| $\mathbf{6}$ | 21 | 42 | $/ /$ | 2 | 6.66 |
| $\mathbf{7}$ | 20 | 40 | $/ / / /$ | 4 | 13.3 |
| $\mathbf{8}$ | 19 | 38 | $/ / / /$ | 4 | 13.3 |
| $\mathbf{9}$ | 18 | 36 | $/ / /$ | 3 | 10 |
| $\mathbf{1 0}$ | 17 | 34 | $/ /$ | 2 | 6.66 |
| $\mathbf{1 1}$ | 15 | 30 | $/$ | 1 | 3.3 |
| $\mathbf{1 2}$ | 14 | 28 | $/$ | 1 | 3.3 |
| $\mathbf{1 3}$ | 13 | 26 | $/$ | 1 | 3.3 |
| $\mathbf{1 4}$ | 11 | 22 | $/$ | 1 | 3.3 |
|  | $\mathbf{\Sigma}$ | $\mathbf{f}$ | $\mathbf{3 0}$ | $\mathbf{3 0}$ | $\mathbf{1 0 0 \%}$ |

## B. Mean Score and Standard Deviation

| Table 2. The Mean Score |  |  |  |
| :---: | :---: | :---: | :---: |
| NO | $\mathbf{x}$ | $\mathbf{f}$ | $\mathbf{f x}$ |
| $\mathbf{1}$ | 6,8 | 1 | 6,8 |
| $\mathbf{2}$ | 5 | 2 | 10 |
| $\mathbf{3}$ | 4,8 | 3 | 14,4 |
| $\mathbf{4}$ | 4,6 | 3 | 13,8 |
| $\mathbf{5}$ | 4,4 | 2 | 8,8 |
| $\mathbf{6}$ | 4,2 | 2 | 8,4 |
| $\mathbf{7}$ | 4 | 4 | 16 |
| $\mathbf{8}$ | 3,8 | 4 | 15,2 |
| $\mathbf{9}$ | 3,6 | 3 | 10,8 |
| $\mathbf{1 0}$ | 3,4 | 2 | 6,8 |
| $\mathbf{1 1}$ | 3 | 1 | 3 |
| $\mathbf{1 2}$ | 2,8 | 1 | $\mathbf{2 , 8}$ |
| $\mathbf{1 3}$ | 2,6 | 1 | $\mathbf{2 , 6}$ |
| $\mathbf{1 4}$ | 2,2 | 1 | $\mathbf{2 , 2}$ |
| $\mathbf{\Sigma}$ | $\mathbf{5 5 , 2}$ | $\mathbf{3 0}$ | $\mathbf{1 2 1 , 6}$ |

$$
X=\frac{\sum f x}{N}=\frac{121.6}{30}=4.05
$$

Table 3. The Standard Deviation

| NO | $\mathbf{X}$ | $\mathbf{d}$ | $\mathbf{d}^{\mathbf{2}}$ |
| :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | 6,8 | $\mathbf{2 , 7}$ | 7,29 |
| $\mathbf{2}$ | 5 | 0,9 | 0,81 |
| $\mathbf{3}$ | 5 | 0,9 | 0,81 |
| $\mathbf{4}$ | 4,8 | 0,7 | 0,49 |
| $\mathbf{5}$ | 4,8 | 0,7 | 0,49 |
| $\mathbf{6}$ | 4,8 | 0,7 | 0,49 |
| $\mathbf{7}$ | 4,6 | 0,5 | 0,25 |
| $\mathbf{8}$ | 4,6 | 0,5 | 0,25 |
| $\mathbf{9}$ | 4,6 | 0,5 | 0,25 |
| $\mathbf{1 0}$ | 4,4 | 0,3 | 0,09 |
| $\mathbf{1 1}$ | 4,4 | 0,3 | 0,09 |
| $\mathbf{1 2}$ | 4,2 | 0,1 | 0,01 |
| $\mathbf{1 3}$ | 4,2 | 0,1 | 0,01 |
| $\mathbf{1 4}$ | 4 | $-0,05$ | 0,0025 |

$$
\begin{aligned}
& \text { s.d. }=\sqrt{\frac{\sum d^{2}}{N}} \\
& \text { s.d. }=\sqrt{\frac{21,2325}{30}} \\
& \text { s.d. }=\sqrt{0,70775} \\
& \text { s.d. }=0.84
\end{aligned}
$$

| $\mathbf{1 5}$ | 4 | $-0,05$ | 0,0025 |
| :---: | :---: | :---: | :---: |
| $\mathbf{1 6}$ | 4 | $-0,05$ | 0,0025 |
| $\mathbf{1 7}$ | 4 | $-0,05$ | 0,0025 |
| $\mathbf{1 8}$ | 3,8 | $-0,25$ | 0,0625 |
| $\mathbf{1 9}$ | 3,8 | $-0,25$ | 0,0625 |
| $\mathbf{2 0}$ | 3,8 | $-0,25$ | 0,0625 |
| $\mathbf{2 1}$ | 3,8 | $-0,25$ | 0,0625 |
| $\mathbf{2 2}$ | 3,6 | $-0,45$ | 0,2025 |
| $\mathbf{2 3}$ | 3,6 | $-0,45$ | 0,2025 |
| $\mathbf{2 4}$ | 3,6 | $-0,45$ | 0,2025 |
| $\mathbf{2 5}$ | 3,4 | $-0,65$ | 0,4225 |
| $\mathbf{2 6}$ | 3,4 | $-0,65$ | 0,4225 |
| $\mathbf{2 7}$ | 3 | $-1,05$ | 1,1025 |
| $\mathbf{2 8}$ | 2,8 | $-1,25$ | 1,5625 |
| $\mathbf{2 9}$ | 2,6 | $-1,45$ | 2,1025 |
| $\mathbf{3 0}$ | 2,2 | $-1,85$ | 3,4225 |
| $\boldsymbol{\Sigma}$ | $\mathbf{1 2 1 , 6}$ | $-\mathbf{0 , 5 5}$ | $\mathbf{2 1 , 2 3 2 5}$ |

## C. Reliability

In calculating the reliability, the writer used the formula of Pearson Product Moment Correlation as follows:
$r_{x y} \quad=$ Pearson Product Moment Correlation between variables x and y
$N \quad=$ Number of students taking the test
$\sum x=$ Sum of variable x
$\sum y=$ Sum of variable y
$\sum x y=$ Sum of multiplication of variable x and variable y
$\sum x^{2}=$ Sum of square x
$\sum y^{2}=$ Sum of square y

| Table 4. The Reliability Test |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| NO | X | Y | $\mathrm{X}^{\mathbf{2}}$ | $\mathbf{Y}^{\mathbf{2}}$ | XY |
| 1 | 8 | 14 | 64 | 196 | 112 |
| 2 | 11 | 14 | 121 | 196 | 154 |
| 3 | 11 | 14 | 121 | 196 | 154 |
| 4 | 8 | 11 | 64 | 121 | 88 |
| 5 | 11 | 13 | 121 | 169 | 143 |
| 6 | 11 | 9 | 121 | 81 | 99 |
| 7 | 9 | 6 | 81 | 36 | 54 |
| 8 | 8 | 11 | 64 | 121 | 88 |
| 9 | 10 | 10 | 100 | 100 | 100 |
| 10 | 10 | 10 | 100 | 100 | 100 |
| 11 | 14 | 10 | 196 | 100 | 140 |
| 12 | 8 | 10 | 64 | 100 | 80 |
| 13 | 10 | 13 | 100 | 169 | 130 |
| 14 | 11 | 10 | 121 | 100 | 110 |
| 15 | 7 | 10 | 49 | 100 | 70 |
| 16 | 9 | 9 | 81 | 81 | 81 |
| 17 | 9 | 10 | 81 | 100 | 90 |
| 18 | 5 | 9 | 25 | 81 | 45 |
| 19 | 15 | 19 | 225 | 361 | 285 |
| 20 | 10 | 13 | 100 | 169 | 130 |
| 21 | 10 | 10 | 100 | 100 | 100 |
| 22 | 9 | 14 | 81 | 196 | 126 |
| 23 | 8 | 11 | 64 | 121 | 88 |
| 24 | 4 | 7 | 16 | 49 | 28 |
| 25 | 11 | 7 | 121 | 49 | 77 |
| 26 | 11 | 11 | 121 | 121 | 121 |
| 27 | 8 | 9 | 64 | 81 | 72 |
| 28 | 9 | 12 | 81 | 144 | 108 |
| 29 | 7 | 6 | 49 | 36 | 42 |
| 30 | 12 | 12 | 144 | 144 | 144 |
| $\Sigma$ | 284 | 324 | 2840 | 3718 | 3159 |

$r_{x y}=\frac{N \sum x y-\left(\sum x\right)\left(\sum y\right)}{\sqrt{\left[N \sum x^{2}-\left(\sum x\right)^{2}\right]\left[N \sum y^{2}-\left(\sum y\right)^{2}\right]}}$

$$
\begin{aligned}
& r_{x y}=\frac{(30 \times 3159)-(284 \times 324)}{\sqrt{\left[(30 \times 2840)-(284)^{2}\right]\left[(30 \times 3718)-(324)^{2}\right]}} \\
& r_{x y}=\frac{94770-92016}{\sqrt{[(85200-80656)][(11540-104976)]}} \\
& r_{x y}=\frac{2754}{\sqrt{[4544] \cdot[6564]}} \\
& r_{x y}=\frac{2754}{\sqrt{29826816}} \\
& r_{x y}=\frac{2754}{5461,39}=0,50
\end{aligned}
$$

The result of this calculation is then analyzed using Spearman-Brown odd even model correlation to see the reliability of the test because the test of reliability uses a Split-half.

$$
r_{t t}=\frac{2 r_{h h}}{1+r_{h h}}
$$

$r_{t t}=$ Total test coefficient reliability ( $\mathrm{tt}=$ total test )
$r_{h h}=$ Product moment Correlation Coefficient between the first half and the second half of the test (hh = half-half)
$1 \& 2=$ Constant numbers

$$
\begin{aligned}
r_{t t} & =\frac{2 \times 0,50}{1+0,50} \\
& =\frac{1}{1,5} \quad=0,7
\end{aligned}
$$

Based on the analysis, the test of reliability equals to 0.7 which is the standard of reliability that is 0.70 .

## D．Validity

| $\star$ | N | N | N | 7 | － | 인 | $\stackrel{\square}{\square}$ | 7 | 우 | N | N | $\stackrel{\infty}{\square}$ | $\stackrel{\sim}{\sim}$ | ন | へ | $\stackrel{\infty}{\square}$ | 7 | $\checkmark$ | m | N | N | $\stackrel{\sim}{\sim}$ | 9 | $\overrightarrow{-1}$ | $\stackrel{\infty}{-1}$ | N | A | त | $\cdots$ | N | \％ |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| in | $\rightarrow$ | $\rightarrow$ | － 0 | － | 0 | $\rightarrow$ | 0 | －- | $\rightarrow$ | $\bigcirc$ | $\checkmark$ | － | $\rightarrow$ | 0 | 0 | 0 | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | － | $\rightarrow$ | $\rightarrow$ | $\bigcirc$ | $\bigcirc$ | 0 | $\rightarrow$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | $\stackrel{\square}{-1}$ | N | ¢ | ¢ | ल | ${ }_{6}$ |  |
| \％ | $\rightarrow$ | 10 | $\bigcirc$ | － | 0 | － | － | －-1 | $\rightarrow$ | － | $\checkmark$ | － | 0 | $\bigcirc$ | － | － | $\bigcirc$ | $\rightarrow$ | 0 | $\bigcirc$ | － | － | $\bigcirc$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | － | － |  | $\cdots$ | ¢ | ल | 品 | \％ | H |  |
| $\stackrel{\infty}{\square}$ | $\bigcirc$ | 0 | 0 | － | 0 | 0 | － | 0 | 0 | 0 | － | $\square$ | 0 | $\checkmark$ | $\bigcirc$ | － | $\rightarrow$ | － | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | － | 0 | 0 | 0 | 0 | － | $\bigcirc$ | － |  |  | ส | ल | \％ | N | F | n |
| F |  | － | $\rightarrow 0$ | 0 | － | 0 | $\bigcirc$ | 0 | － | 0 | $\bigcirc$ | － | $\rightarrow$ | － | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | － | 0 | － | － | $\rightarrow$ | 0 | 0 | － | － | 0 | $\bigcirc$ | $\bigcirc$ |  | $\infty$ | ～ | ल | ¢ | m | $\stackrel{\sim}{\circ}$ |  |
| 4 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | 0 | $\bigcirc$ | － | $\rightarrow 7$ | 0 | 0 | $\bigcirc$ | － | 0 | $\bigcirc$ | $\checkmark$ | $\bigcirc$ | － | － | 0 | $\bigcirc$ | 0 | 0 | － | 0 | 0 | 0 | $\checkmark$ | － | － | － | － | ${ }_{\sim}^{\sim}$ | ल | d | ก | $\stackrel{\circ}{\circ}$ | $\cdots$ |
| $\stackrel{1}{9}$ | $\bigcirc$ | $\bigcirc$ | －- | $\bigcirc$ | 0 | $\bigcirc$ | 0 | 0 | 0 | － | － | － | 0 | － | － | $\bigcirc$ | $\rightarrow$ | $\bigcirc$ | $\rightarrow$ | － | － | 0 | $\bigcirc$ | 0 | $\rightarrow$ | 0 | 0 | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | 9 | สี่ | \％ | 品 | m | $\stackrel{\square}{\circ}$ | $\stackrel{\infty}{\square}$ |
| F | － | － | $\square$ | － | － | $\bigcirc$ | $\bigcirc$ | － 7 | $\checkmark$ | － | $\rightarrow$ | $\square$ | $\rightarrow$ | $\checkmark$ | $\bigcirc$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | 0 | $\checkmark$ | 0 | $\checkmark$ | － | $\checkmark$ | $\stackrel{\sim}{*}$ | $\stackrel{\text { ® }}{ }$ | 第 | あ | \％ | 궁 | $\stackrel{\text { ¢ }}{\text { \％}}$ |
| 尔 | $\bigcirc$ | $\bigcirc$ | －－ | $\rightarrow$ | 0 | － | $\bigcirc$ | －-1 | $\rightarrow$ | $\checkmark$ | $\checkmark$ | － | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | 0 | $\rightarrow$ | $\rightarrow$ | 0 | 0 | － | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | 0 | $\checkmark$ | － | $\bigcirc$ | $\stackrel{\sim}{\sim}$ | $\stackrel{\text { ¢ }}{ }$ | $\stackrel{\sim}{0}$ | 吕 | $\stackrel{\circ}{\circ}$ | น | $\bigcirc$ |
| สั |  | 0 | － | $\bigcirc$ | $\bigcirc$ | － | － | － | 0 | 0 | $\bigcirc$ | 0 | 0 | $\bigcirc$ | － | － | 0 | 0 | $\rightarrow$ | － | － | － | － | － | － | － | 0 | $\bigcirc$ | $\bigcirc$ | － | － | \％ | M | 吕 | \％ | ¢ | ${ }^{\text {N }}$ |
| 7 | $\bigcirc$ | 0 | $\bigcirc$ | － | $\bigcirc$ | － | 10 | 0 | 0 | 0 | $\checkmark$ | － | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | 0 | $\rightarrow$ | 0 | 0 | $\bigcirc$ | $\rightarrow$ | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | च | i | 怘 | $\stackrel{m}{0}$ | ® | $\stackrel{1}{7}$ |
| 夺 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | 0 | 0 | $\bigcirc$ | － | － | － | $\checkmark$ | － | $\rightarrow$ | 0 | $\bigcirc$ | $\checkmark$ | － | $\checkmark$ | $\checkmark$ | 0 | － | － | － | $\neg$ |  | 0 | $\checkmark$ | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | － | $\sim$ | $\stackrel{\sim}{\sim}$ | ल | d | ¢ | \％ |  |
| 2 | $\bigcirc$ | $\bigcirc$ | －－ | $\bigcirc$ | $\bigcirc$ | 0 | － | 10 | 0 | $\rightarrow$ | $\bigcirc$ | 0 | 0 | 0 | $\bigcirc$ | － | 0 | 0 | － | 0 | 0 | $\rightarrow$ | $\bigcirc$ | 0 |  | 0 | $\checkmark$ | $\checkmark$ | － |  |  | ¢ | $\stackrel{\sim}{3}$ | ¢ | \％ | ก－ |  |
| ¢ | － | $\xrightarrow{-1}$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | － | － | $\rightarrow-$ | $\rightarrow$ | $\rightarrow$ | $\bigcirc$ | $\rightarrow$ | $\bigcirc$ | 0 | $\rightarrow$ | － | $\checkmark$ | $\rightarrow$ | － | $\rightarrow$ | $\rightarrow$ | － 7 | － | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | － | － | $\bigcirc$ | $\checkmark$ | $\stackrel{\sim}{*}$ | ल． | \％ | 吕 | \％ | $\stackrel{7}{6}$ |  |
| N | $\bigcirc$ | 0 | $\bigcirc$ | － | 0 | － | － | 10 | $\checkmark$ | $\rightarrow$ | － | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | 0 | $\checkmark$ | $\checkmark$ | 0 | $\rightarrow$ | $\rightarrow$ | 0 | － | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | ন | － | ¢ | \％ | ค | － |
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| m | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | － | 0 | $\rightarrow$ | － | 0 | － | $\rightarrow$ | $\rightarrow$ | － | $\bigcirc$ | － | － | － | $\rightarrow$ | － | $\checkmark$ | － | － |  |  | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | $\checkmark$ | － | $\stackrel{\square}{\square}$ | $\stackrel{\square}{\text { ju }}$ | ¢ | ¢ | ก | นٌ | 宕 |
| ～్ల | $\checkmark$ | $\rightarrow$ | －10 | $\bigcirc$ | $\checkmark$ | － | 0 | 0 | － | － | $\bigcirc$ | $\bigcirc$ | $\checkmark$ | $\bigcirc$ | － | $\bigcirc$ | － | － | $\rightarrow$ | 0 | $\bigcirc$ | 0 | $\bigcirc$ | 0 |  | 0 | － | $\bigcirc$ | $\bigcirc$ | $\checkmark$ |  | $\stackrel{\sim}{\text { ² }}$ | $\stackrel{\text { in }}{\text { in }}$ | ¢ | ¢ | ${ }_{0}$ | － |
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| 年 | － |  | 0 | － | 0 | － | － | $\rightarrow$ |  | $\checkmark$ | － | － | $\bigcirc$ | － | － | － |  |  | $\rightarrow$ | $\checkmark$ | 0 | $\checkmark$ |  |  |  |  | － | － | $\bigcirc$ |  |  | $\cdots$ | ¢ | ¢ | ¢ |  | \％ |
| ก | $\bigcirc$ | －- | －10 | － | $-$ | 0 | 0 | 0 | 0 | 0 | － | 0 | $\rightarrow$ | $\rightarrow$ | $\bigcirc$ | － | 0 | 0 | $\checkmark$ | － | 0 | － | － | 0 | － | 0 | 0 | － | $\checkmark$ | $\checkmark$ | $\infty$ | $\stackrel{\text { ®̇ }}{ }$ | ल． | 品 | \％ | ก | $\stackrel{\square}{9}$ |
| N | $\bigcirc$ | － | －-1 | 0 | － | 0 | － | － |  | 0 | － | 0 | $\rightarrow$ | $\bigcirc$ | － | － | － | － | $\checkmark$ | $\bigcirc$ | 0 | $\rightarrow$ | $\rightarrow$ | － | － | $\bigcirc$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\sim$ | ネี | 俞 | ప | ¢ | $\stackrel{\square}{\circ}$ | $\stackrel{\sim}{\sim}$ |
| స | $\bigcirc$ | 0 | －－ | 0 | 0 | － | － | 0 | － | 0 | $\checkmark$ | － | 0 | － | $\bigcirc$ | $\bigcirc$ | $\rightarrow$ | － | $\checkmark$ | － | 0 | － | 0 | － | 0 | 0 | $\rightarrow$ | $\bigcirc$ | $\bigcirc$ |  |  | － | \％ | 品 | ¢ | F |  |
| సె | $\bigcirc$ |  | － 0 | － | － | － | － | 0 |  |  | － | 0 | 0 | － | 0 | － | 0 |  | $\bigcirc$ | 0 | 0 | 0 |  |  |  | 0 | 0 | － | $\bigcirc$ | $\bigcirc$ | － | － | $\stackrel{\text { in }}{ }$ | 言 | － |  |  |
| の | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | 0 | 0 | － | $\bigcirc$ | － | 0 | 0 | $\rightarrow$ | $\bigcirc$ | 0 | 0 | － | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ |  | $\stackrel{\sim}{\sim}$ | $\stackrel{\sim}{2}$ | ¢ | $\stackrel{\square}{\circ}$ | d． | 㟯 |
| $\stackrel{\infty}{\sim}$ | $\bigcirc$ | － | $-10$ | $\rightarrow$ | $\rightarrow$ | － | $\bigcirc$ | $\checkmark$ | 0 | 0 | $\bigcirc$ | $\rightarrow$ | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | $\rightarrow$ | $\checkmark$ | $\bigcirc$ | 0 | 0 | － | 0 | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | － |  | $\cdots$ | － | $\stackrel{\text { i }}{ }$ | 品 | \％ | ก | \％ |
| 今 | $\checkmark$ | 10 | 0 | $\checkmark$ | 0 | － | $\bigcirc$ | －-1 | 0 | 0 | － | － | 0 | － | $\bigcirc$ | $\bigcirc$ | 0 | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | 0 | $\checkmark$ | $\rightarrow$ | 0 | $\bigcirc$ | － |  |  | $\stackrel{\text { j }}{ }$ | ～ | ¢ | ¢ | $\stackrel{\circ}{\circ}$ | $\stackrel{\square}{\circ}$ |
| $\stackrel{\square}{\square}$ | $\checkmark$ | $\rightarrow-$ | $\rightarrow-$ | $\rightarrow$ | $\square$ | 0 | － | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | － | － | $\checkmark$ | $\checkmark$ | $\checkmark$ | － | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ |  | $\checkmark$ | $\rightarrow$ | 0 | $\checkmark$ | － | $\checkmark$ | ～ | ～ | ～ | ¢ | \％ | 궁 | $\stackrel{\text { \％}}{\sim}$ |
| $\cdots$ |  | $\bigcirc$ | －10 | － | $\rightarrow$ | O | 0 | 0 | － | 0 | $\bigcirc$ | 0 | $\checkmark$ | － | $\bigcirc$ | － | 0 | 0 | $\neg$ | $\rightarrow$ | 0 | 0 | 0 | 0 |  | 0 | 0 | － | － |  |  | ～ | － | ¢ | กั | \％ | $\stackrel{\circ}{\text { ¢ }}$ |
| む | $\bigcirc$ | － | －- | － | － | 0 | 0 | 0 | $\checkmark$ | $\rightarrow$ | － | $\checkmark$ | $\checkmark$ | $\bigcirc$ | $\checkmark$ | － | 0 | 0 | － | 0 | 0 | 0 | 0 | － | $\bigcirc$ | $\checkmark$ | 0 | $\checkmark$ | $\bigcirc$ |  | $\approx$ | $\stackrel{\text { d }}{ }$ | $\stackrel{\sim}{i}$ | ¢ | ¢ | ¢ | $\stackrel{\square}{\square}$ |
| $\cdots$ | － | 0 | $\bigcirc$ | $\bigcirc$ | 0 | － | － | － 0 | $\rightarrow$ | － | $\checkmark$ | － | 0 | － | － | 0 | 0 | $\rightarrow$ | － | － | $\rightarrow$ | 0 | － |  | 0 | $\checkmark$ | $\bigcirc$ | － | 0 | $\bigcirc$ | $\square$ | न | 俞 | ¢ | \％ | แ | 号 |
| ～ | $\bigcirc$ | 0 | $\bigcirc$ | $\bigcirc$ | 0 | － | O | 0 | 0 | 0 | 0 | 0 | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | － | 0 | $\bigcirc$ | $\rightarrow$ | $\rightarrow$ | 0 | － | $\bigcirc$ | 0 | 0 | 0 | 0 | $\checkmark$ | $\bigcirc$ |  |  | $\stackrel{\text { m }}{\text { d }}$ | $\stackrel{\text { i }}{ }$ | ¢ | ก | ¢ | $\stackrel{\sim}{\sim}$ |
| च | $\checkmark$ | $\rightarrow-$ | $\rightarrow-1$ | $\rightarrow$ | － | － | － | 0 | $\rightarrow$ | $\rightarrow$ | $\bigcirc$ | $\rightarrow$ | $\checkmark$ | － | － | $\checkmark$ | $\rightarrow$ |  | $\rightarrow$ | $\bigcirc$ | $\rightarrow$ | 0 | $\rightarrow$ |  |  | $\rightarrow$ | － | － | － |  | $\stackrel{ }{*}$ | N | $\stackrel{\square}{\text { a }}$ | 品 | \％ | $\stackrel{7}{8}$ | $\stackrel{\text { \％}}{\substack{\text { ¢ }}}$ |
| $\bigcirc$ | $\checkmark$ | － 0 | $\checkmark$ | － | 0 | 0 | 0 | $\bigcirc$ | 0 | 0 | $\checkmark$ | － | $\bigcirc$ | － | － | $\bigcirc$ | $\rightarrow$ | － | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | － | 0 | $\bigcirc$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\bigcirc$ | － |  |  | ～ | ¢ | ¢ | \％ | $\stackrel{\circ}{\circ}$ | $\stackrel{\text { g }}{\text { g }}$ |
| 9 | $\neg$ | $\rightarrow 7$ | $-10$ | 0 | －1 | － | － | $\rightarrow$ | $\rightarrow$ | 0 | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | $\bigcirc$ | $\bigcirc$ |  |  | 0 | $\bigcirc$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ |  | $\checkmark$ | $\rightarrow$ | － | $\bigcirc$ | $\bigcirc$ |  | \％ | N | 俞 | 亳 | へ̀ | m | － |
| $\infty$ | $\checkmark$ | － | ${ }^{-1}-$ | $\rightarrow$ | $\rightarrow$ | O | 0 | 0 | $\checkmark$ | － | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | － | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | $\checkmark$ | $\bigcirc$ | $\rightarrow$ | 0 | $\bigcirc$ | － | $\checkmark$ | ～ | － | $\stackrel{\sim}{\sim}$ | ¢ | － | స్่ | 另 |
|  | $\bigcirc$ | 0 | 0 | － | 0 | 0 | － | 10 | 0 | 0 | $\bigcirc$ | － | 0 | 0 | $\bigcirc$ | $\bigcirc$ | 0 | 0 | 0 | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | － | － | － | $\stackrel{1}{4}$ | ल | ¢ | \％ | ¢ | $\stackrel{\rightharpoonup}{i}$ |
|  | $\checkmark$ | $\square$ | $\square-1$ | 0 | － | 0 | － | －-1 | $\rightarrow$ | $\checkmark$ | $\bigcirc$ | － | $\rightarrow$ | $\checkmark$ | $\checkmark$ | － | 0 | 0 | $\checkmark$ | 0 | 0 | $\checkmark$ | 0 | 0 | $\checkmark$ | 0 | $\checkmark$ | － | － | $\checkmark$ | A | N | － | ¢ | $\stackrel{\circ}{\circ}$ | ¢ | － |
|  | $\bigcirc$ | $\checkmark$ | $-1$ | $\bigcirc$ | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | － | － | $\bigcirc$ | $\rightarrow$ | － | $\bigcirc$ | 0 | $\bigcirc$ | $\checkmark$ | $\rightarrow$ | 0 | 0 | 0 | － | 0 | 0 | 0 | － | － | $\checkmark$ | $\bigcirc$ | ${ }^{\sim}$ | \％ | 号 | N | ¢ | ® |
|  | $\checkmark$ | $\checkmark$ | $-7$ | $\rightarrow$ | － | － | O | $\rightarrow$ | 0 | 0 | $\checkmark$ | － | $\checkmark$ | $\rightarrow$ | － | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | 0 | 0 | $\checkmark$ | 0 | $\bigcirc$ | $\bigcirc$ | $\checkmark$ | \％ | $\stackrel{\square}{\text { a }}$ | 商 | ¢ | ก－ | m | ＋ |
|  | $\bigcirc$ | 0 | 0 | $\rightarrow$ | 0 | 0 | 0 | 0 | 0 | $\checkmark$ | － | － | 0 | $\checkmark$ | $\bigcirc$ | $\checkmark$ | $\checkmark$ | － | 0 | － | $\rightarrow$ | 0 | 0 | 0 | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | － | $\bigcirc$ |  | $\bigcirc$ | ¢ | $\stackrel{\text { n }}{\text { in }}$ | ¢ | \％ | ¢ |  |
|  | $\checkmark$ | $\square$ | $\rightarrow-1$ | $\rightarrow$ | －1 | － | － | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | $\rightarrow$ | － | $\rightarrow$ | $\checkmark$ | $\checkmark$ | $\rightarrow$ | － | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\checkmark$ | $\checkmark$ | $\checkmark$ | $\rightarrow$ | $\rightarrow$ | － | $\checkmark$ |  | － | ¢ | \％ | ¢ | $\stackrel{\circ}{\circ}$ | \％ | $\stackrel{\circ}{\circ}$ |
|  | $\bigcirc$ | 0 | 0 | － | $\bigcirc$ | 0 | 0 | 0 | 0 | $\bigcirc$ | 0 | － | 0 | $\checkmark$ | $\bigcirc$ | $\bigcirc$ | $\bigcirc$ | － | 0 | 0 | 0 | $\rightarrow$ | － | 0 | 0 | 0 | 0 | 0 | $\bigcirc$ | $\bigcirc$ | m | ั | M | 嵩 | ： | \％ | ${ }_{0}$ |
| 宏 |  |  |  |  | 京 | $\begin{gathered} \frac{0}{5} \\ \hline \end{gathered}$ | 糖 | 岩 | $\begin{aligned} & \frac{\bar{\rightharpoonup}}{\stackrel{\rightharpoonup}{4}} \\ & \hline \end{aligned}$ | 들 | $\left.\begin{array}{\|l\|} \frac{2}{2} \\ \frac{2}{\bar{x}} \end{array} \right\rvert\,$ | $$ | $\frac{\dot{3}}{\stackrel{i}{2}}$ | $\begin{array}{\|c} \substack{x \\ \dot{j} \\ \dot{\Sigma} \\ \hline} \\ \hline \end{array}$ | $\begin{array}{\|c} \substack{\alpha \\ \dot{j} \\ \dot{\Sigma} \\ \hline} \\ \hline \end{array}$ | $\begin{array}{\|c\|} \hline \begin{array}{c} 1 \\ \frac{1}{2} \\ \Sigma \end{array} \\ \hline \end{array}$ | $\frac{1}{2}$ | $\begin{array}{\|l\|} \hline \\ \hline \end{array}$ | $\begin{array}{\|l\|} \hline \frac{0}{4} \\ \hline \frac{1}{2} \\ \hline \end{array}$ | 蹴 |  |  |  | $\begin{aligned} & \text { 気 } \\ & \text { 足 } \end{aligned}$ | $\frac{\tilde{y}}{\hat{0}}$ | E | $$ | 衰 | $\stackrel{5}{5}$ | $\begin{array}{\|l\|l} \frac{2}{1} \\ 3 \end{array}$ | 茵 | $\stackrel{1}{2}$ | $\sum$ | क | $\sim$ | 0 | 合 |
| $\stackrel{1}{2}$ |  | $\rightarrow$ | $\sim \mathrm{m}$ | － | in | $\bullet$ | － | $\infty$ | の | － | $\square$ | \％ | $\cdots$ | － | $\stackrel{\square}{7}$ | $\because$ | न | $\stackrel{\sim}{\sim}$ | 9 | \％ | － | $\approx$ | $\underset{\sim}{\sim}$ | d | $\stackrel{\sim}{\sim}$ | $\stackrel{\sim}{\sim}$ | え | $\stackrel{\sim}{\sim}$ | ล | 앙 |  |  |  |  |  |  |  |

The following Items are the examples of Validity which are taken from Item 1,3 , and 24 as the examples.

$$
r_{p b i}=\frac{M_{p}-M_{t}}{S D_{t}} \sqrt{\frac{p}{q}}
$$

## Item \# 1

$p=\frac{\sum x}{N}=\frac{3}{30}=0.1$
$q=1-\mathrm{p}=1-0.1=0.9$
$M_{t}=\frac{608}{30}=20.3$
$M_{p}=\frac{(23+21+18)}{3}=20.6$
$\mathrm{SD}_{\mathrm{t}}=0.84$
$r_{p b i}=\frac{20.6-20.3}{0.84} \times \sqrt{\frac{0.1}{0.9}}=\frac{0.3}{0.84} \times \sqrt{0.11}=\frac{0.3}{0.84} \times 0.33$
$r_{p b i}=\mathbf{0 . 1 1}$

## Item \# 3

$p=\frac{\sum x}{N}=\frac{10}{30}=0.3$
$q=1-\mathrm{p}=1-0.3=0.7$
$M_{t}=\frac{608}{30}=20.3$
$M_{b}=\frac{(22+21+21+20+20+19+19+18+18+17)}{10}=19.5$
$\mathrm{SD}_{\mathrm{t}}=0.84 \mathrm{l}$
$r_{p b i}=\frac{19.5-20.3}{0.84} \times \sqrt{\frac{0.3}{0.7}}=\frac{-0.8}{0.84} \times \sqrt{0.43}=\frac{-0.8}{0.84} \times 0.7$
$r_{p b i}=-\mathbf{0 . 7}$

## Item \# 24

$$
\begin{aligned}
& p=\frac{\sum x}{N}=\frac{12}{30}=0.4 \\
& q=1-\mathrm{p}=1-0.4=0.6 \\
& M_{t}=\frac{608}{30}=20.3 \\
& M_{p}=\frac{\left(34+23+23+22+21+20+20+19+19+19 \_18+17\right)}{12}=21.3
\end{aligned}
$$

$\mathrm{SD}_{\mathrm{t}}=0.84$
$r_{p b i}=\frac{21.3-20.3}{0.84} \times \sqrt{\frac{0.4}{0.6}}=\frac{1}{0.84} \times \sqrt{0.66}=\frac{1}{0.84} \times 0.66$
${ }_{p b i}=\mathbf{0 . 9 9}$

Table 6. Validity of Items

| ITEM | $\mathbf{M}_{\mathbf{p}}$ | $\mathbf{M}_{\mathbf{t}}$ | $\mathbf{S D}_{\mathbf{t}}$ | $\mathbf{p}$ | $\mathbf{q}$ | $\mathbf{r}_{\mathbf{p b i}}$ | QUALITY |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | 20.6 | 20.3 | 0.84 | 0.1 | 0.9 | 0.11 | Invalid |
| $\mathbf{2}$ | 20.4 | 20.3 | 0.84 | 0.96 | 0.04 | 0.6 | Valid |
| $\mathbf{3}$ | 19.5 | 20.3 | 0.84 | 0.3 | 0.7 | -07 | Invalid |
| $\mathbf{4}$ | 25.16 | 20.3 | 0.84 | 0.7 | 0.3 | 2.64 | Invalid |
| $\mathbf{5}$ | 20.2 | 20.3 | 0.84 | 0.2 | 0.8 | 2.89 | Invalid |
| $\mathbf{6}$ | 20.2 | 20.3 | 0.84 | 0.6 | 0.4 | -0.1 | Invalid |
| $\mathbf{7}$ | 15 | 20.3 | 0.84 | 0.03 | 0.97 | 1.07 | Invalid |
| $\mathbf{8}$ | 20.6 | 20.3 | 0.84 | 0.73 | 0.27 | 0.58 | Valid |
| $\mathbf{9}$ | 20.2 | 20.3 | 0.84 | 0.7 | 0.3 | -0.2 | Invalid |
| $\mathbf{1 0}$ | 22 | 20.3 | 0.84 | 0.4 | 0.6 | 1.49 | Invalid |
| $\mathbf{1 1}$ | 20.2 | 20.3 | 0.84 | 0.83 | 0.17 | -0.3 | Invalid |
| $\mathbf{1 2}$ | 24.3 | 20.3 | 0.84 | 0.2 | 0.8 | 2.38 | Invalid |
| $\mathbf{1 3}$ | 21.1 | 20.3 | 0.84 | 0.5 | 0.5 | 0.95 | Valid |
| $\mathbf{1 4}$ | 21.4 | 20.3 | 0.84 | 0.4 | 0.6 | 1.06 | Invalid |
| $\mathbf{1 5}$ | 25.5 | 20.3 | 0.84 | 0.2 | 0.8 | 3.09 | Invalid |
| $\mathbf{1 6}$ | 21.2 | 20.3 | 0.84 | 0.83 | 0.17 | 2.35 | Invalid |

The Validity Streches of quality is 0.304 1.000

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| 17 | 21.4 | 20.3 | 0.84 | 0.4 | 0.6 | 1.06 | Invalid |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 18 | 20.6 | 20.3 | 0.84 | 0.43 | 0.57 | 0.30 | Valid |
| 19 | 27.5 | 20.3 | 0.84 | 0.06 | 0.94 | 2.05 | Invalid |
| 20 | 0 | 20.3 | 0.84 | 0 | 0 | 0 | Invalid |
| 21 | 23.1 | 20.3 | 0.84 | 0.23 | 0.77 | 1.76 | Invalid |
| 22 | 22.1 | 20.3 | 0.84 | 0.4 | 0.6 | 1.73 | Invalid |
| 23 | 22.8 | 20.3 | 0.84 | 0.3 | 0.7 | 1.90 | Invalid |
| 24 | 21.3 | 20.3 | 0.84 | 0.4 | 0.6 | 0.96 | Valid |
| 25 | 20.9 | 20.3 | 0.84 | 0.83 | 0.17 | 1.57 | Invalid |
| 26 | 22.1 | 20.3 | 0.84 | 0.5 | 0.5 | 2.14 | Invalid |
| 27 | 20.7 | 20.3 | 0.84 | 0.43 | 0.57 | 0.40 | Valid |
| 28 | 21.8 | 20.3 | 0.84 | 0.53 | 0.47 | 1.87 | Invalid |
| 29 | 21.3 | 20.3 | 0.84 | 0.8 | 0.2 | 2.38 | Invalid |
| 30 | 18 | 20.3 | 0.84 | 0.2 | 0.8 | -1.3 | Invalid |
| 31 | 21.2 | 20.3 | 0.84 | 0.4 | 0.6 | 0.86 | Valid |
| 32 | 24.5 | 20.3 | 0.84 | 0.23 | 0.77 | 2.65 | Invalid |
| 33 | 21.6 | 20.3 | 0.84 | 0.5 | 0.5 | 1.54 | Invalid |
| 34 | 19.4 | 20.3 | 0.84 | 0.2 | 0.8 | -0.5 | Invalid |
| 35 | 21 | 20.3 | 0.84 | 0.4 | 0.6 | 0.66 | Valid |
| 36 | 25 | 20.3 | 0.84 | 0.13 | 0.87 | 2.07 | Invalid |
| 37 | 22.1 | 20.3 | 0.84 | 0.3 | 0.7 | 1.37 | Invalid |
| 38 | 20.3 | 20.3 | 0.84 | 0.83 | 0.17 | 0 | Invalid |
| 39 | 18.8 | 20.3 | 0.84 | 0.3 | 0.7 | -1.1 | Invalid |
| 40 | 18 | 20.3 | 0.84 | 0.4 | 0.6 | -2.2 | Invalid |
| 41 | 24.2 | 20.3 | 0.84 | 0.13 | 0.87 | 1.71 | Invalid |
| 42 | 34 | 20.3 | 0.84 | 0.03 | 0.97 | 2.77 | Invalid |
| 43 | 19.8 | 20.3 | 0.84 | 0.6 | 0.5 | -0.6 | Invalid |
| 44 | 20.8 | 20.3 | 0.84 | 0.83 | 0.17 | 1.30 | Invalid |
| 45 | 22.2 | 20.3 | 0.84 | 0.33 | 0.67 | 1.58 | Invalid |
| 46 | 18 | 20.3 | 0.84 | 0.2 | 0.8 | -1.3 | Invalid |
| 47 | 22.2 | 20.3 | 0.84 | 0.3 | 0.7 | 1.44 | Invalid |
| 48 | 22.7 | 20.3 | 0.84 | 0.23 | 0.77 | 1.51 | Invalid |
| 49 | 18.7 | 20.3 | 0.84 | 0.43 | 0.57 | -1.6 | Invalid |
| 50 | 21.5 | 20.3 | 0.84 | 0.53 | 0.47 | 1.5 | Invalid |

## E. Difficulty Level and Discrimination Power

$I F=\frac{U G+L G}{N}$
$I D=\frac{U G-L G}{n}$
IF = index of facility;
ID = index of discrimination;
$\mathrm{n}=$ number of students in one group $(1 / 2 \mathrm{~N})$;
$\mathrm{UG}=$ frequency of score by upper group (upper half); and
$\mathrm{LG}=$ frequency of score by lower group (lower half).

Item No. 1

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 13 | 14 | 27 |
| B* | 2 | 1 | 3 |
| C | 0 | 0 | 0 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{3}{30}=0.1 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.07
\end{aligned}
$$

## Item No. 2

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 15 | 14 | 29 |
| B | 0 | 1 | 1 |
| C | 0 | 0 | 0 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{29}{30}=0.96 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.06
\end{aligned}
$$

Item No. 3

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 10 | 4 | 14 |
| B | 1 | 1 | 2 |
| C | 1 | 3 | 4 |
| D* | 3 | 7 | 10 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{10}{30}=0.33 \\
& I D=\frac{U G-L G}{n}=\frac{-4}{15}=-0.26
\end{aligned}
$$

Item No. 4

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 0 | 4 | 4 |
| B | 1 | 2 | 3 |
| C | 1 | 2 | 3 |
| D* | 13 | 7 | 20 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{20}{30}=0.66 \\
& I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
\end{aligned}
$$

Item No. 5

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 0 | 1 |
| B | 0 | 5 | 5 |
| C* | 6 | 0 | 6 |
| D | 8 | 10 | 18 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
\end{aligned}
$$

Item No. 6

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 11 | 6 | 17 |
| B | 0 | 2 | 2 |
| C | 0 | 2 | 2 |
| D | 4 | 5 | 9 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{17}{30}=0.56 \\
& I D=\frac{U G-L G}{n}=\frac{5}{15}=0.33
\end{aligned}
$$

## Item No. 7

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 3 | 1 | 4 |
| B | 8 | 12 | 11 |
| C* | 0 | 1 | 1 |
| D | 4 | 1 | 5 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{1}{30}=0.03 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

Item No. 8

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 13 | 9 | 22 |
| B | 0 | 1 | 1 |
| C | 2 | 5 | 7 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{22}{30}=0.73 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

## Item No. 9

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 1 | 2 |
| B | 3 | 5 | 8 |
| C* | 11 | 9 | 21 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{21}{30}=0.7 \\
& I D=\frac{U G-L G}{n}=\frac{2}{15}=0.13
\end{aligned}
$$

Item No. 10

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 5 | 7 |
| B | 0 | 1 | 1 |
| C | 7 | 4 | 11 |
| D* | 6 | 5 | 11 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{11}{30}=0.36 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.06
\end{aligned}
$$

Item No. 11

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 1 | 2 |
| B* | 12 | 13 | 25 |
| C | 0 | 0 | 0 |
| D | 2 | 1 | 3 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

## Item No. 12

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 6 | 0 | 6 |
| B | 2 | 6 | 8 |
| C | 4 | 8 | 12 |
| D | 3 | 1 | 4 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
\end{aligned}
$$

Item No. 13

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 9 | 5 | 14 |
| B | 4 | 3 | 7 |
| C | 2 | 5 | 7 |
| D | 0 | 2 | 2 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{14}{30}=0.46 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

Item No. 14

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 6 | 8 |
| B | 1 | 3 | 4 |
| C | 4 | 2 | 6 |
| D* | 8 | 4 | 12 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

## Item No. 15

|  | UG | LG | UG + LG |
| :---: | :---: | :---: | :---: |
| A | 4 | 10 | 14 |
| B | 3 | 1 | 4 |
| C | 1 | 4 | 5 |
| D* | 6 | 0 | 6 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
\end{aligned}
$$

Item No. 16

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 0 | 1 | 1 |
| B | 0 | 1 | 1 |
| C\% | 14 | 11 | 25 |
| D | 1 | 2 | 3 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 17

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 6 | 6 | 12 |
| B | 1 | 0 | 1 |
| C | 5 | 0 | 5 |
| D | 3 | 8 | 11 |
| O | 0 | 1 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 18

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 9 | 7 | 16 |
| B | 0 | 0 | 0 |
| C* | 6 | 7 | 13 |
| D | 0 | 0 | 0 |
| O | 0 | 1 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{13}{30}=0.43 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.6
\end{aligned}
$$

Item No. 19

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 4 | 6 |
| B | 0 | 2 | 2 |
| C* | 2 | 0 | 2 |
| D | 11 | 9 | 20 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{2}{30}=0.06 \\
& I D=\frac{U G-L G}{n}=\frac{2}{15}=0.13
\end{aligned}
$$

Item No. 20

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 7 | 6 | 13 |
| B | 2 | 4 | 6 |
| C* | 0 | 0 | 0 |
| D | 4 | 4 | 8 |
| O | 2 | 1 | 3 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{0}{30}=0 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 21

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 5 | 2 | 7 |
| B | 0 | 5 | 5 |
| C | 10 | 8 | 18 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{7}{30}=0.23 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 22

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 3 | 4 |
| B | 2 | 2 | 4 |
| C* | 8 | 4 | 12 |
| D | 4 | 6 | 10 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4
$$

$$
I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
$$

Item No. 23

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 4 | 6 |
| B | 1 | 2 | 3 |
| C* | 6 | 2 | 8 |
| D | 6 | 7 | 13 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{8}{30}=0.26 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

## Item No. 24

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 6 | 6 | 12 |
| B | 0 | 2 | 2 |
| C | 7 | 6 | 13 |
| D | 2 | 1 | 3 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 25

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 13 | 12 | 25 |
| B | 0 | 1 | 1 |
| C | 1 | 1 | 2 |
| D | 0 | 1 | 1 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.06
\end{aligned}
$$

Item No. 26

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 8 | 9 |
| B | 0 | 1 | 1 |
| C\% | 12 | 3 | 15 |
| D | 1 | 2 | 3 |
| O | 1 | 1 | 2 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{15}{30}=0.5 \\
& I D=\frac{U G-L G}{n}=\frac{9}{15}=0.6
\end{aligned}
$$

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Item No. 27

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 3 | 3 | 6 |
| B | 1 | 7 | 8 |
| C | 2 | 0 | 2 |
| D* | 8 | 5 | 13 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{13}{30}=0.43 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 28

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 1 | 3 |
| B* | 10 | 6 | 16 |
| C | 1 | 6 | 7 |
| D | 0 | 2 | 2 |
| O | 2 | 0 | 2 |
|  | 15 | 15 | 30 |

$$
I F=\frac{U G+L G}{N} \quad \frac{16}{30}=0.53
$$

$$
I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
$$

## Item No. 29

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 3 | 4 |
| B | 0 | 1 | 1 |
| C | 0 | 1 | 1 |
| D* | 14 | 10 | 24 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{24}{30}=0.8 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

Item No. 30

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 6 | 4 | 10 |
| B | 1 | 5 | 6 |
| C\% | 3 | 3 | 6 |
| D | 5 | 3 | 8 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 31

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 6 | 8 |
| B | 3 | 3 | 6 |
| C | 2 | 0 | 2 |
| D* | 6 | 6 | 12 |
| O | 2 | 0 | 2 |
|  | 15 | 15 | 30 |

$$
I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4
$$

$$
I D=\frac{U G-L G}{n}=\frac{0}{15}=0
$$

## Item No. 32

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| $\mathrm{A}^{*}$ | 7 | 0 | 7 |
| B | 3 | 8 | 11 |
| C | 0 | 0 | 0 |
| D | 3 | 7 | 10 |
| 0 | 2 | 0 | 2 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{7}{30}=0.23 \\
& I D=\frac{U G-L G}{n}=\frac{7}{15}=0.46
\end{aligned}
$$

## Item No. 33

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 9 | 6 | 15 |
| B | 1 | 2 | 3 |
| C | 2 | 3 | 5 |
| D | 2 | 4 | 6 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{15}{30}=0.5 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 34

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 3 | 6 | 9 |
| B | 0 | 3 | 3 |
| C\% | 2 | 3 | 5 |
| D | 10 | 3 | 13 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{5}{30}=0.16 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

## Item No. 35

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 2 | 3 | 5 |
| B* | 7 | 4 | 11 |
| C | 1 | 7 | 8 |
| D | 5 | 1 | 6 |
| 0 | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{11}{30}=0.36 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 36

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 0 | 3 | 3 |
| B | 6 | 6 | 12 |
| C | 5 | 5 | 10 |
| D* | 4 | 0 | 4 |
| O | 0 | 1 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{4}{30}=0.13 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

Item No. 37

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A $^{*}$ | 6 | 3 | 9 |
| B | 6 | 1 | 7 |
| C | 3 | 6 | 9 |
| D | 0 | 5 | 5 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{9}{30}=0.3 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

## Item No. 38

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 0 | 1 |
| B* | 12 | 13 | 25 |
| C | 1 | 2 | 3 |
| D | 1 | 0 | 1 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

Item No. 39

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 3 | 0 | 3 |
| B | 1 | 8 | 9 |
| C | 8 | 1 | 9 |
| D* | 3 | 6 | 9 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{9}{30}=0.3 \\
& I D=\frac{U G-L G}{n}=\frac{-3}{15}=-0.2
\end{aligned}
$$

Item No. 40

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A $^{*}$ | 2 | 10 | 12 |
| B | 1 | 4 | 5 |
| C | 7 | 1 | 8 |
| D | 5 | 0 | 5 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{12}{30}=0.4 \\
& I D=\frac{U G-L G}{n}=\frac{-8}{15}=-0.53
\end{aligned}
$$

## Item No. 41

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 4 | 7 | 11 |
| B | 1 | 2 | 3 |
| C | 6 | 5 | 11 |
| D* | 3 | 1 | 4 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{4}{30}=0.13 \\
& I D=\frac{U G-L G}{n}=\frac{2}{15}=0.13
\end{aligned}
$$

Item No. 42

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 5 | 7 | 12 |
| B | 8 | 7 | 15 |
| C* | 1 | 1 | 2 |
| D | 0 | 0 | 0 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{2}{30}=0.06 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 43

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 2 | 3 |
| B* | 8 | 10 | 18 |
| C | 0 | 0 | 0 |
| D | 5 | 3 | 8 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{18}{30}=0.6 \\
& I D=\frac{U G-L G}{n}=\frac{-2}{15}=-0.13
\end{aligned}
$$

## Item No. 44

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 0 | 1 | 1 |
| B | 0 | 3 | 3 |
| C* | 14 | 11 | 25 |
| D | 1 | 0 | 1 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

## Item No. 45

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 7 | 8 | 15 |
| B | 3 | 1 | 4 |
| C* | 5 | 5 | 10 |
| D | 0 | 1 | 1 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{10}{30}=0.33 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 46

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 1 | 5 | 6 |
| B | 0 | 0 | 0 |
| C | 5 | 6 | 11 |
| D | 8 | 4 | 12 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{-4}{15}=-0.26
\end{aligned}
$$

Item No. 47

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 8 | 11 | 19 |
| B* $^{*}$ | 7 | 1 | 8 |
| C | 0 | 0 | 0 |
| D | 0 | 3 | 3 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{8}{30}=0.26 \\
& I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
\end{aligned}
$$

## Item No. 48

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 4 | 5 | 9 |
| B | 7 | 4 | 11 |
| C | 0 | 3 | 3 |
| D* | 4 | 3 | 7 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{7}{30}=0.23 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.06
\end{aligned}
$$

Item No. 49

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 6 | 7 | 13 |
| B | 0 | 0 | 0 |
| C | 1 | 4 | 5 |
| D | 8 | 4 | 12 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{13}{30}=0.43 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

## Item No. 50

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 5 | 5 | 10 |
| B | 0 | 0 | 0 |
| C* | 10 | 6 | 16 |
| D | 0 | 4 | 4 |
| 0 | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{16}{30}=0.6 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$



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## The Item of Difficulty

## Proper Item Difficulty : 0.25-0.75

Ex: Item No. 1
$I F=\frac{U G+L G}{N} \quad \frac{3}{30}=0.1$

Table. 8

| ITEM | FU | FL | FU+FL | IF | Quality |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 1 | 3 | 0.1 | Improper |
| 2 | 15 | 14 | 29 | 0.96 | Improper |
| 3 | 3 | 7 | 10 | 0.33 | Proper |
| 4 | 13 | 7 | 20 | 0.66 | Proper |
| 5 | 6 | 0 | 6 | 0.2 | Proper |
| 6 | 11 | 6 | 17 | 0.56 | Proper |
| 7 | 0 | 1 | 0 | 0.03 | Improper |
| 8 | 13 | 9 | 22 | 0.73 | Proper |
| 9 | 11 | 9 | 20 | 0.7 | Proper |
| 10 | 6 | 5 | 11 | 0.36 | Proper |
| 11 | 12 | 13 | 25 | 0.83 | Improper |
| 12 | 6 | 0 | 6 | 0.2 | Proper |
| 13 | 9 | 5 | 14 | 0.46 | Proper |
| 14 | 8 | 4 | 12 | 0.4 | Proper |
| 15 | 6 | 0 | 6 | 0.2 | Proper |
| 16 | 14 | 11 | 25 | 0.83 | Improper |
| 17 | 6 | 6 | 12 | 0.4 | Proper |
| 18 | 6 | 7 | 13 | 0.43 | Proper |
| 19 | 2 | 0 | 2 | 0.06 | Improper |
| 20 | 0 | 0 | 0 | 0 | Proper |
| 21 | 5 | 2 | 7 | 0.23 | Improper |
| 22 | 8 | 4 | 12 | 0.4 | Proper |


| 23 | 6 | 2 | 8 | 0.26 | Proper |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 24 | 6 | 6 | 12 | 0.4 | Proper |
| 25 | 13 | 12 | 25 | 0.53 | Proper |
| 26 | 12 | 3 | 15 | 0.5 | Proper |
| 27 | 8 | 5 | 13 | 0.43 | Proper |
| 28 | 10 | 6 | 16 | 0.53 | Proper |
| 29 | 14 | 10 | 24 | 0.8 | Improper |
| 30 | 3 | 3 | 6 | 0.2 | Proper |
| 31 | 6 | 6 | 12 | 0.4 | Proper |
| 32 | 7 | 0 | 7 | 0.23 | Proper |
| 33 | 9 | 6 | 15 | 0.5 | Proper |
| 34 | 2 | 3 | 5 | 0.16 | Improper |
| 35 | 7 | 4 | 11 | 0.36 | Proper |
| 36 | 4 | 0 | 4 | 0.13 | Improper |
| 37 | 6 | 3 | 9 | 0.3 | Proper |
| 38 | 12 | 13 | 25 | 0.83 | Improper |
| 39 | 3 | 6 | 9 | 0.3 | Proper |
| 40 | 2 | 10 | 12 | 0.4 | Proper |
| 41 | 3 | 1 | 4 | 0.13 | Improper |
| 42 | 1 | 1 | 2 | 0.06 | Improper |
| 43 | 8 | 10 | 18 | 0.6 | Proper |
| 44 | 14 | 11 | 25 | 0.83 | Improper |
| 45 | 5 | 5 | 10 | 0.33 | Proper |
| 46 | 1 | 5 | 6 | 0.2 | Proper |
| 47 | 7 | 1 | 8 | 0.26 | Proper |
| 48 | 4 | 3 | 7 | 0.23 | Proper |
| 49 | 6 | 7 | 13 | 0.43 | Proper |
| 50 | 10 | 6 | 16 | 0.33 | Proper |

The Item of Discrimination

Proper Item Discrimination: 0.25-1
Ex: Item No. 1
$I D=\frac{U G-L G}{n} \quad \frac{1}{15}=0.07$

Table. 9

| ITEM | FU | FL | FU-FL | ID | Quality |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | 2 | 1 | 1 | 0.07 | Improper |
| 2 | 15 | 14 | 1 | 0.06 | Improper |
| 3 | 3 | 7 | -4 | -0.26 | Improper |
| 4 | 13 | 7 | 6 | 0.4 | Proper |
| 5 | 6 | 0 | 6 | 0.4 | Proper |
| 6 | 11 | 6 | 5 | 0.33 | Proper |
| 7 | 0 | 1 | 0 | -0.06 | Improper |
| 8 | 13 | 9 | 4 | 0.26 | Proper |
| 9 | 11 | 9 | 2 | 0.13 | Improper |
| 10 | 6 | 5 | 1 | 0.06 | Improper |
| 11 | 12 | 13 | -1 | -0.06 | Improper |
| 12 | 6 | 0 | 6 | 0.4 | Proper |
| 13 | 9 | 5 | 4 | 0.26 | Proper |
| 14 | 8 | 4 | 4 | 0.26 | Proper |
| 15 | 6 | 0 | 6 | 0.4 | Proper |
| 16 | 14 | 11 | 3 | 0.2 | Improper |
| 17 | 6 | 6 | 0 | 0 | Improper |
| 18 | 6 | 7 | -1 | -0.6 | Improper |
| 19 | 2 | 0 | 2 | 0.13 | Improper |
| 20 | 0 | 0 | 0 | 0 | Improper |
| 21 | 5 | 2 | 3 | 0.2 | Improper |
| 22 | 8 | 4 | 4 | 0.26 | Proper |


| 23 | 6 | 2 | 4 | 0.26 | Proper |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 24 | 6 | 6 | 0 | 0 | Improper |
| 25 | 13 | 12 | 1 | 0.06 | Improper |
| 26 | 12 | 3 | 9 | 0.6 | Proper |
| 27 | 8 | 5 | 4 | 0.2 | Improper |
| 28 | 10 | 6 | 4 | 0.26 | Proper |
| 29 | 14 | 10 | 4 | 0.26 | Proper |
| 30 | 3 | 3 | 0 | 0 | Improper |
| 31 | 6 | 6 | 0 | 0 | Improper |
| 32 | 7 | 0 | 7 | 0.46 | Proper |
| 33 | 9 | 6 | 3 | 0.2 | Improper |
| 34 | 2 | 3 | -1 | -0.06 | Improper |
| 35 | 7 | 4 | 3 | 0.2 | Improper |
| 36 | 4 | 0 | 4 | 0.26 | Proper |
| 37 | 6 | 3 | 3 | 0.2 | Improper |
| 38 | 12 | 13 | -1 | -0.06 | Improper |
| 39 | 3 | 6 | -3 | -0.2 | Improper |
| 40 | 2 | 10 | -8 | -0.53 | Improper |
| 41 | 3 | 1 | 2 | 0.13 | Improper |
| 42 | 1 | 1 | 0 | 0 | Improper |
| 43 | 8 | 10 | -2 | -0.13 | Improper |
| 44 | 14 | 11 | 3 | 0.2 | Improper |
| 45 | 5 | 5 | 0 | 0 | Improper |
| 46 | 1 | 5 | -4 | -0.26 | Improper |
| 47 | 7 | 1 | 6 | 0.4 | Proper |
| 48 | 4 | 3 | 1 | 0.06 | Improper |
| 49 | 6 | 7 | -1 | -0.06 | Improper |
| 50 | 10 | 6 | 4 | 0.26 | Proper |

## F. Distractor Power

The following items show whether the distractors of a question function in a test or not. Only items that its distractors do not function or is not significant influence to the testees are taken out.

Item No. 1

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 13 | 14 | 27 |
| B* | 2 | 1 | 3 |
| C | 0 | 0 | 0 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{3}{30}=0.1 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.07
\end{aligned}
$$

## Item No. 2

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 15 | 14 | 29 |
| B | 0 | 1 | 1 |
| C | 0 | 0 | 0 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{29}{30}=0.96 \\
& I D=\frac{U G-L G}{n}=\frac{1}{15}=0.06
\end{aligned}
$$

## Item No. 8

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A* | 13 | 9 | 22 |
| B | 0 | 1 | 1 |
| C | 2 | 5 | 7 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{22}{30}=0.73 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

Item No. 9

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 1 | 2 |
| B | 3 | 5 | 8 |
| C* | 11 | 9 | 21 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{21}{30}=0.7 \\
& I D=\frac{U G-L G}{n}=\frac{2}{15}=0.13
\end{aligned}
$$

Item No. 11

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 1 | 2 |
| B* | 12 | 13 | 25 |
| C | 0 | 0 | 0 |
| D | 2 | 1 | 3 |
| 0 | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{25}{30}=0.83 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

## Item No. 18

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 9 | 7 | 16 |
| B | 0 | 0 | 0 |
| C* | 6 | 7 | 13 |
| D | 0 | 0 | 0 |
| O | 0 | 1 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{13}{30}=0.43 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.6
\end{aligned}
$$

Item No. 21

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A $^{*}$ | 5 | 2 | 7 |
| B | 0 | 5 | 5 |
| C | 10 | 8 | 18 |
| D | 0 | 0 | 0 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{7}{30}=0.23 \\
& I D=\frac{U G-L G}{n}=\frac{3}{15}=0.2
\end{aligned}
$$

Item No. 32

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A $^{*}$ | 7 | 0 | 7 |
| B | 3 | 8 | 11 |
| C | 0 | 0 | 0 |
| D | 3 | 7 | 10 |
| 0 | 2 | 0 | 2 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{7}{30}=0.23 \\
& I D=\frac{U G-L G}{n}=\frac{7}{15}=0.46
\end{aligned}
$$

Item No. 42

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 5 | 7 | 12 |
| B | 8 | 7 | 15 |
| C* | 1 | 1 | 2 |
| D | 0 | 0 | 0 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{2}{30}=0.06 \\
& I D=\frac{U G-L G}{n}=\frac{0}{15}=0
\end{aligned}
$$

Item No. 43

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 1 | 2 | 3 |
| B* | 8 | 10 | 18 |
| C | 0 | 0 | 0 |
| D | 5 | 3 | 8 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \frac{18}{30}=0.6 \\
& I D=\frac{U G-L G}{n}=\frac{-2}{15}=-0.13
\end{aligned}
$$

## Item No. 46

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A * $^{*}$ | 1 | 5 | 6 |
| B | 0 | 0 | 0 |
| C | 5 | 6 | 11 |
| D | 8 | 4 | 12 |
| O | 1 | 0 | 1 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{6}{30}=0.2 \\
& I D=\frac{U G-L G}{n}=\frac{-4}{15}=-0.26
\end{aligned}
$$

Item No. 47

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 8 | 11 | 19 |
| B* | 7 | 1 | 8 |
| C | 0 | 0 | 0 |
| D | 0 | 3 | 3 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
I F=\frac{U G+L G}{N} \quad \frac{8}{30}=0.26
$$

$$
I D=\frac{U G-L G}{n}=\frac{6}{15}=0.4
$$

Item No. 49

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A $^{*}$ | 6 | 7 | 13 |
| B | 0 | 0 | 0 |
| C | 1 | 4 | 5 |
| D | 8 | 4 | 12 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{13}{30}=0.43 \\
& I D=\frac{U G-L G}{n}=\frac{-1}{15}=-0.06
\end{aligned}
$$

## Item No. 50

|  | UG | LG | UG+LG |
| :---: | :---: | :---: | :---: |
| A | 5 | 5 | 10 |
| B | 0 | 0 | 0 |
| C \% | 10 | 6 | 16 |
| D | 0 | 4 | 4 |
| O | 0 | 0 | 0 |
|  | 15 | 15 | 30 |

$$
\begin{aligned}
& I F=\frac{U G+L G}{N} \quad \frac{16}{30}=0.6 \\
& I D=\frac{U G-L G}{n}=\frac{4}{15}=0.26
\end{aligned}
$$

The following is the table of an overall quality of Validity, Difficulty, and Discrimination that shows the quality of Proper and Improper test of an item.

Table. 10 The Overall Quality of the Test


| ITEM | VALIDITY | DIFFICULTY | DISCRIMINATION | QUALITY | STATED |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | 0.11 | 0.1 | 0.07 | $-V-D-S$ | Improper |
| $\mathbf{2}$ | 0.6 | 0.96 | 0.06 | $+V-D-S$ | Improper |
| $\mathbf{3}$ | -7 | 0.33 | -0.26 | $-V+D-S$ | Improper |
| $\mathbf{4}$ | 2.64 | 0.66 | 0.4 | $-V+D+S$ | Improper |
| $\mathbf{5}$ | 2.89 | 0.2 | 0.4 | $-V+D+S$ | Improper |
| $\mathbf{6}$ | -0.1 | 0.56 | 0.33 | $-V+D+S$ | Improper |
| $\mathbf{7}$ | 1.07 | 0.03 | -0.06 | $-V-D-S$ | Improper |
| $\mathbf{8}$ | 0.58 | 0.73 | 0.26 | $+V+D+S$ | Proper |
| $\mathbf{9}$ | -0.2 | 0.7 | 0.13 | $-V+D-S$ | Improper |
| $\mathbf{1 0}$ | 1.49 | 0.36 | 0.06 | $-V+D-S$ | Improper |
| $\mathbf{1 1}$ | -0.3 | 0.83 | -0.06 | $-V-D-S$ | Improper |
| $\mathbf{1 2}$ | 2.38 | 0.2 | 0.4 | $-V+D+S$ | Improper |
| $\mathbf{1 3}$ | 0.95 | 0.46 | 0.26 | $+V+D+S$ | Proper |
| $\mathbf{1 4}$ | 1.06 | 0.4 | 0.26 | $-V+D+S$ | Improper |
| $\mathbf{1 5}$ | 3.09 | 0.2 | 0.4 | $-V-D+S$ | Improper |
| $\mathbf{1 6}$ | 2.35 | 0.83 | 0.2 | $-V+D-S$ | Improper |
| $\mathbf{1 7}$ | 1.06 | 0.4 | 0 | $-V+D-S$ | Improper |
| $\mathbf{1 8}$ | 0.30 | 0.43 | -0.6 | $+V+D-S$ | Improper |
| $\mathbf{1 9}$ | 2.05 | 0.06 | 0.13 | $-V-D-S$ | Improper |
| $\mathbf{2 0}$ | 0 | 0 | 0 | $-V-D-S$ | Improper |
| $\mathbf{2 1}$ | 1.76 | 0.23 | 0.2 | $-V+D-S$ | Improper |


| $\mathbf{2 2}$ | 1.73 | 0.4 | 0.26 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{2 3}$ | 1.90 | 0.26 | 0.26 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{2 4}$ | 0.96 | 0.4 | 0 | $+\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{2 5}$ | 1.57 | 0.53 | 0.06 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{2 6}$ | 2.14 | 0.5 | 0.6 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{2 7}$ | 0.40 | 0.43 | 0.2 | $+\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{2 8}$ | 1.87 | 0.53 | 0.26 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{2 9}$ | 2.38 | 0.8 | 0.26 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{3 0}$ | -1.3 | 0.2 | 0 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 1}$ | 0.86 | 0.4 | 0 | $+\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 2}$ | 2.65 | 0.23 | 0.46 | $--\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{3 3}$ | 1.54 | 0.5 | 0.2 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 4}$ | -0.5 | 0.16 | -0.06 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 5}$ | 0.66 | 0.36 | 0.2 | $+\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 6}$ | 2.07 | 0.13 | 0.26 | $-\mathrm{V}-\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{3 7}$ | 1.37 | 0.3 | 0.2 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 8}$ | 0 | 0.83 | -0.06 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{3 9}$ | -1.1 | 0.3 | -0.2 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 0}$ | -2.2 | 0.4 | -0.53 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 1}$ | 1.71 | 0.13 | 0.13 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 2}$ | 2.77 | 0.06 | 0 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 3}$ | -0.6 | 0.6 | -0.13 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 4}$ | 1.30 | 0.83 | 0.2 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 5}$ | 1.58 | 0.33 | 0 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 6}$ | -1.3 | 0.2 | -0.26 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 7}$ | 1.44 | 0.26 | 0.4 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |
| $\mathbf{4 8}$ | 1.51 | 0.23 | 0.06 | $-\mathrm{V}-\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{4 9}$ | -1.6 | 0.43 | -0.06 | $-\mathrm{V}+\mathrm{D}-\mathrm{S}$ | Improper |
| $\mathbf{5 0}$ | 1.5 | 0.33 | 0.26 | $-\mathrm{V}+\mathrm{D}+\mathrm{S}$ | Improper |

## CHAPTER IV

## CONCLUSION

After analyzing the test which had been tried-out on Monday, $11^{\text {th }}$ November 2013 , thus the writer can conclude several points.

Starting with the mode of the test which is 40 and 38 because there are eight testees at overall have this mark, the median is between 38 to 40 in the case that there are only fourteen numbers of frequency and thus the score halfway between the lowest score in the top half and the highest score in the buttom half is taken as the medium. The mean score is 4.05 . Standard deviation of the test is 0.84 means that this standard of deviation shows a smaller spread of score from the mean. In terms of validity, it can be said that most of items in the test have small score of validity, even there are only eight items considered to be valid. The reliability is enough reliable because it is found that the reliability coefficient is 0.7 . There are 36 items of the index of Difficulty that get Proper remark while index of discrimination has 17 items. So, most items should be fixed in order to fulfill the criteria of good test. The last is the Distractor Power. From 50 items constructed, there are only 14 items that have the distractors functioned.

Shortly, in overall, the test designed by the tester shows low level of Validity, high index of difficulty and bad discrimination. So, the tester concludes that the test is not qualified to be administered to the second semester students of the ninth grade of Junior School.

## APPENDICES

## Sample of Students’ Answer Sheet

Surat Keterangan Telah Melakukan Try-out

## REFERENCES

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