UNIT 2: PSYCHOLOGICAL TEST

UNIT STRUCTURE

2.1 Learning Objectives

2.2 Introduction

2.3 A Brief History of Psychological Testing

2.4 Meaning of Psychological Test

2.4.1 Nature of Psychological Test

2.5 Test, Examination and Evaluation

2.6 Types of Psychological Test

2.7 Functions of Psychological Test

2.8 Uses of Psychological Test

2.9 Meaning of a Good Test

2.9.1 Criteria of a Good Test

2.9.2 Practical Criteria of a Good Test

2.9.3 Technical Criteria of a Good Test

2.10 Let Us Sum Up

2.11 Further Reading

2.12 Answer to Check Your Progress

2.13 Model Questions

2.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- explain the concept of psychological test
- trace the history of psychological Testing
- explain the nature of psychological Test
- distinguish between Test, Examination and Evaluation
- describe the different ways that Psychological Tests can be classified
- describe the various functions of Psychological Tests
- state the various uses of Psychological Tests

2.2 INTRODUCTION

Psychological tests are of immense use in the field of education, above and beyond their use in other fields of human activity. Psychological tests are mainly constructed and used to study intelligence, aptitude, achievement, and various other scholastic and non-scholastic personality traits of individuals and groups in the field of education. These tests help to determine and analyse the nature of individual differences among learners in terms of intellectual development, academic and non-academic personality characteristics associated with age and sex. Further, analysis of the personality characteristics of gifted, retarded, or educationally backward, as well as the personality traits of the neurotics and psychotics are possible through psychological tests.

Educational institutions widely use psychological tests for making various decisions that involve classification, prediction, comparison, and selection of students and also for making administrative policies and management of the institution. Moreover, psychological tests are useful in providing educational and vocational guidance and counselling to students on the basis of the findings made available by test results about the strengths, weaknesses, and other psycho-physical traits of pupils. Psychological tests are also of use in employment, business, industry, and many other areas of work that affect the lives of many people. In this unit, you will be able to trace the history of psychological testing and will also be able to understand the concept, nature, function and uses of psychological test.

2.3 A BRIEF HISTORY OF PSYCHOLOGICAL TESTING

The history of psychological testing is very long and can be traced back to around 2200 B.C. when the Chinese emperors used rudimentary forms of tests to select officials and to examine their fitness for office every third year. Such testing, through modifications over the centuries, ultimately took the form of written exams that were introduced during the Han dynasty

(202B.C.-A.D. 200). However, psychological testing in its modern form was initiated only during the era of brass instruments that flourished in Europe during the late 1800s. During that period, many physicians and psychiatrists developed standardized procedures to study the symptoms of the mentally ill and brain-injured individuals. One of the most renowned among them, was Hubert von Grashey, who developed the precursor to the memory drum to test the visual recognition skill of brain-injured patients in 1885. Francis Galton attempted to measure intelligence by means of tests of sensory and imagery discrimination. Galton also developed his famous 'Galton whistle' for measuring sensitivity to high pitched tones. In 1879, Wilhelm Wundt founded the first psychological laboratory in Leipzig, Germany. Wundt also developed a thought meter, with which he attempted to measure the speed of thought. James Cattell, an American psychologist, made the first reference to mental tests in one of his classic papers published in 1890. French physicians, Esquirol and Seguin, working on the diagnosis and remedy of the mentally retarded, established the necessity for intelligence tests in the late 1800s. However, it was Alfred Binet and his associate Theodore Simon who developed the first proper intelligence test in Paris, France in 1905.The first Binet-Simon intelligence test was a simple 30-item test which was devised mainly to identify schoolchildren who could not profit from normal instruction. The original Binet test of intelligence was revised in 1908, and in 1911.The original French Binet-Simon intelligence test was later adapted in the Stanford University, USA by Lewis Terman which was known as Stanford-Binet intelligence scale. This scale was first introduced in 1916, and was subsequently revised in 1937, 1960, and in 1972. German psychologist William Stern introduced the concept of Intelligence Quotient which was to be obtained by dividing the mental age by the chronological age. Later, Terman suggested multiplying the intelligence quotient by 100 to remove fractions and thus the concept of IQ was born.

2.4 MEANING AND DEFINITION OF PSYCHOLOGICAL TEST

Measurement and evaluation in education is the process of comprehensive and scientific assessment of the intended changes in learner behaviour that are credited to instruction or education. This process of measurement and evaluation provides necessary information about the progress of students towards the achievement of educational goals. Neither the student nor the teacher can progress satisfactorily towards educational goals without such knowledge. Hence, different tools of measurement are used to collect such knowledge and information. A psychological test is one of the most useful tools used in educational measurement and evaluation.

A psychological test is a collection of some questions (items) to be answered or tasks to be performed by the testee (examinee). Such collection of questions or tasks is used to measure intelligence, knowledge, skill, or other traits of personality of an individual or a group. This collection of questions or tasks (test) is required for the reason that intelligence, achievement, or other such trait or characteristic cannot be measured directly unlike the measurement of the objects of the physical world. Measurement of the objects of the physical world is direct and easy because such measurement can be done using universally acceptable standard tools and units. Conversely, psychological measurement that involves the measurement of knowledge, skill, aptitude, achievement, or any other trait of the personality cannot be measured until and unless they are manifest in the behaviour of man. Therefore, it is required to make the abstract trait or quality to be measured explicit in the behaviour of the individual so as to make it measureable, and hence some stimuli in the form of questions or tasks are given to the testees so that their responses could be observed, recorded and measured. The questions to be answered or the tasks to be performed are so selected or framed that the response of the testee to such question/task could make the trait to be measured explicit and measureable. Thus, a psychological test may be understood as a set of

carefully selected stimuli in the form of questions to be answered or tasks to be performed to elicit a sample of behaviour required to measure a particular psychological trait or characteristic. The definition given by psychologist Marshall is noteworthy in this context, he said, "A psychological test may be defined as a pattern of stimuli, selected and organised to elicit responses which reveal certain characteristics in the person who takes them." However, the definition given by Marshall does not include all the features of a psychological test. Hence, some important definitions of psychological test are presented below:

According to **Frank S. Freeman,** "A psychological test is a standardized instrument designed to measure objectively one or more aspects of a total personality by means of samples of verbal or non-verbal responses, or by means of other behaviours."

Psychologist **Anastasi and Urbina** have defined a psychological test as an objective and standardized measure of a sample of behaviour.

A.K.Singh writes, "A psychological or educational test is a standardized procedure to measure quantitatively or qualitatively one or more than one aspect of a trait by means of a sample of verbal or non-verbal behaviour.

In the words of **McIntire and Miller,** "Psychological tests are instruments that require the testee to perform some behaviour. The behaviour performed is used to measure some personal attribute, trait or characteristic - such as intelligence - that is thought to be important in describing and understanding the behaviour."

Analyses of the foregoing definitions of psychological test help us to conclude that a test consists of some items or tasks to be performed by the testee which elicits a sample behaviour of the testee. Such sample of behaviour indirectly reveals the personality trait or characteristic which is being measured.

2.4.1 Nature of Psychological Test

A psychological test is one of the various tools used in psychological

measurement. A psychological test is used as an instrument to elicit response or behaviour of an individual required for the purpose of measuring some trait, or characteristic of the individual who takes the test. The following important characteristics reveal the nature of a psychological test-

- A psychological test may be understood as a set or pattern of stimuli, selected and organised to elicit responses that reveal certain trait, or characteristics in the individual whose behaviour is to be measured.
- Psychological tests are constructed and used to measure psychological variables which are abstract, unobservable, and cannot be measured directly. Hence, psychological tests are tools of indirect measurement, i.e. they measure psychological variables as the variables become manifest in the behaviour of the individual.
- Psychological tests require a testee to perform some observable and measurable behaviour. When a testee takes a test, he has to answer some questions or to perform some task; and in doing so, the testee is revealing some trait or characteristic in the form of some observable and measurable behaviour.
- In a psychological test, the behaviour which is thought to be important in describing or understanding the trait or characteristic is used to measure that trait, or characteristic.
- In psychological testing, scores or categories are assigned to individuals to represent abstract dimensions of behaviour, traits, or performance of individuals. In fact, psychological testing represents performance or dimensions of behaviour in the form of numbers or classifications.
- A psychological test invariably follows standardized procedure. In simple terms, the procedure for administering a psychological test is uniform in all settings and with all examiners. All psychological tests usually accompany an instructional manual which contain detailed directions for administration of the test.

- A psychological test always measures a limited sample of the behaviour which is important in describing or understanding the trait or characteristic to be measured. Since it is not possible to measure the entire domain of the behaviour due to practical constraints, a test always depends on samples of behaviour to make inference about the total domain of the relevant behaviour.
- Psychological tests aim to measure individual difference in terms of performance, traits, or characteristics. Though all people possess the trait or characteristic being measured, they possess it in different amounts. The objective of psychological test is to measure the amount of the trait or quality possessed by an individual, so that individual difference can be estimated with reference to the trait or quality being measured.
- Psychological tests also accompany norms or standards calculated on the basis of average performance of a group on the same test. Such norms help in interpreting the score or performance of an individual by comparing it with the norm for the group to which the individual belongs.
- The most important feature of a psychological test is that it makes inference about the total domain of behaviour on the basis of the measurement of the sampled behaviour. Thus it makes predictions about the non-tested behaviour or performance, or trait of the testee.
- The construction and administration of psychological tests, is usually based on the following assumptions:
  - Psychological tests measure what they intend to measure, and the inferences made about testees on the basis of their responses to thetest are correct. This is known as the validity of a test.
  - An individual's responses to the test and his testscores remain constant over time. This feature of a test is known as reliability.

- The testees understand the meaning of test items as intended by the tester or the constructor of the test.
- It is also assumed that testees can and will report about themselves and their thoughts and feelings accurately and honestly.
- The test score of an individual is the sum of his or her actual ability and some errors that may result from the test itself, faulty administration of the test, subjective influence of the examiner, psycho-physical condition of the examinee, or adverse environmental influences.

However, it is to be borne in mind that these are only assumptions and may not always prove to be true in the case of any test. The quality of a psychological test depends on the extent to which these assumptions actually come out to be true. It is here that the question of accuracy and authenticity of psychological tests arises and the accuracy, authenticity, and exactness of a tool of physical measurement cannot be claimed by a psychological test.

2.5 TEST, EXAMINATION AND EVALUATION

Test, examination, and evaluation are similar terms and are used interchangeably at times. However, these similar terms have different meanings. Test and examinations are tools of evaluation. As tools of evaluation test and examinations have differences in their meaning and scope. As an important tool of evaluation, a test is a set of items or questions to be answered or tasks to be performed on a certain area or topic. The testee is evaluated on the basis of his answers to the questions or on the basis of his performance on the assigned tasks. An examination too, is a set of questions or tasks; however, an examination includes many areas or topics unlike a test which is focussed only on a single area or topic. Thus, the scope of an examination is wider than a test. An examination can be a collection of many interrelated or interconnected tests. An examination may measure various psycho-physical qualities of examinees, but a test

measures a single dimension of behaviour or personality of the testee. In educational arena, a test and an exam both test the knowledge of a student. So, in most cases tests and exams are synonyms.However, examinations are held at the end of the academic session which includes all subjects or disciplines. On the other hand, tests are held during the academic session which is based on particular units or topics of the curriculum. Moreover, tests are generally diagnostic and formative in nature that aim at checking achievements after a lesson or series of lessons, while examinations are summative and they help in making decision about promoting or retaining students at the end of the academic session.

A test and an exam are both tools and instruments of evaluation. A test aims at measuring a particular portion or part of an object, or of a subject. Examination, in contrast, aims at measuring the object or subject in its entirety. For example, a physician makes an examination of a patient to diagnose diseases. Such physical examination involves many tests, such as, blood test, urine and stool test, test of heart beat, and the like.

Evaluation is a concept which is wider than test and examination. Various tests and examinations are used as tools for evaluation. A test or an examination is usually concerned with any one dimension of the cognitive, affective, or psycho-motor behaviour of the individual. Whereas, evaluation is a comprehensive process and it takes into account all the aspects including cognitive, affective, as well as psycho-motor of behaviour of the individual. Besides, evaluation is a continuous process which uses the information obtained from different tests and examinations held from time to time.



CHECK YOUR PROGRESS

Q 1: What is psychological test?

.....

Q 2: Write two features of psychological test.

.....

2.6 TYPES OF PSYCHOLOGICAL TEST

Psychological tests have been classified into different types on the basis of various criteria. Hence, there is no single classification of psychological tests and the different classifications are not exclusive but they often overlap. The important fact to note is that psychological tests can be classified by the type or nature of the behaviour they measure, the way in which they are administered, the method of their scoring, and how they are used.

Classification on the basis of what they measure or the nature of behaviour measured:

Psychological tests have been classified on the basis of what a test measures or predicts. On the basis of this criterion, psychological tests have been broadly categorized into tests of Typical Performance and tests of Maximum Performance.

A test of typical performance requires the testee to express what they would normally do in a particular situation. In other words, this is a test to find out how testee operate or perform in a given situation. In tests of typical performance answers given by testee are not categorized as right or wrong, but are used to find out the choices, preferences, or feelings of the testee. The tests of typical performance usually measure non-cognitive behaviour, such as personality, interests, motivation, values, and attitudes.

Tests of maximal performance usually measure cognitive behaviour of the individual, such as tests of intelligence, aptitude, achievement and the like .The test items in these tests have either correct or incorrect answers and the respondents are asked to answer correctly as many questions or items as they can. Their scores on the test depend on the number of items they get correct. These tests aim to measure the maximum performance of individuals under standard conditions.

The tests of typical performance or the non-cognitive tests can again be classified into **structured or unstructured tests** on the basis of the nature of the stimuli presented before the respondents. A structured test includes structured items, i.e. items to which the respondents can respond

in predefined or limited number of ways. For example, in a test of personality, respondents may be asked to respond in the forms of 'yes/no' or 'true/ false' to questions about various activities or issues of their lives. These are examples of structured questions. On the other hand, unstructured tests use unstructured stimuli or items to which the respondent can respond freely or in ways that are not limited by the tester. For example, the projective tests of personality use unstructured stimuli such as an inkblot or a picture and the testee is asked to describe what they see or imagine the inkblot or picture. The basic idea behind these projective tests is that when unstructured or ambiguous stimuli are presented before an individual, he/ she will project his or her underlying and unconscious motivations and attitudes. However, the scoring of the unstructured test is more complex than the structured tests.

Cognitive tests may again be classified into **ability tests and achievement tests**. Though both of these two types of tests involve learning and involve what the testee has learned and can do, achievement tests usually involve learning from specialized education and training; while, ability tests usually assess learning that has occurred in general and in one's greater environment.

Further classification of Cognitive tests is done on the basis of **speed tests and power tests.** A speed test contains such items that everyone can get all items correct when they are given enough time. Some tests of clerical skills are examples of this type of tests. On the other hand, Power tests contain difficult questions and enough time is given. These tests intend to measure how much the testee knows or can do; instead of testing the speed at which the testee can answer the questions. Hence in a power test sufficient time is given; and it is measured what they can do. However, there are very few tests that either measures speed or power. Most of the psychological tests are a combination of both.

Classification on the basis of Test Administration:

Psychological tests can again be classified on the basis of how they are administered. Psychological tests can either be administered to an individual at a time or be administered to a group at the same time.

Tests which are administered to one individual at a time is called individual test. The individual test may be verbal, non-verbal, or performance type of test. It was Alfred Binet who popularized the individual test. Binet-Simon tests of intelligence, Alexander Pass-along test, Koh's Block Design test, etc are examples of individual tests. Individual tests help in establishing proper rapport with the testee that helps to increase the accuracy of measurement. Moreover, individual tests are more valid and reliable. However, individual are costly, time-consuming, requires specialists to administer, and most of them are verbal tests that cannot be administered to young children or to people who do not know the language used in the test.

In contrast to the individual tests, group tests are administered to a group of people at a time. These tests may also be verbal or non-verbal tests. Examples of group tests include, Army-Alpha test, Army-Beta test, Army General Classification Test (AGCT), among others. Group tests are useful for testing large number of people at a time. Administrations of these tests are simpler than individual tests and hence they don't require experts for the purpose. Thus, these tests are economical in terms of time, money, and effort required. However, group tests are not as much reliable and valid as individual tests are.

Classification on the basis of use of language:

Psychological tests may be classified on the basis of use of language as well. On the basis of use of language by psychological tests, they have been classified into V**erbal, Non-Verbal, and Performance tests.**

Verbal tests are oldest among all tests. These tests use written as well as spoken language. In verbal tests, generally written questions or instructions are given and the answers must be given in spoken or written language. Since testee have to respond using language, these tests are influenced by their knowledge of the language used in the test. Tests of comprehension, memory, vocabulary, word association, etc. are examples of verbal tests. Usually the group tests are verbal tests. During the recent times, some verbal tests are administered using computers and other electronic media. Verbal tests can be very useful in testing many cognitive

qualities of individuals, such as memory, thinking, reasoning, understanding, analysis, synthesis, and many others. However, since these tests demand mastery over language, verbal tests cannot be successfully used with young children, uneducated, or people who use language other than the one used by the test. Moreover, the reliability and validity of verbal tests are also not always beyond doubt.

Contrary to the verbal tests, Non-verbal tests do not use written or spoken language. Even the instructions to testees are given using demonstration, pantomime, gestures, or using some charts. In place of language, test items are framed using pictures, shapes, symbols, or structures. It is important to note that, though non-verbal tests do not use language, they may use paper and pencils. However, use of paper-pencil in non-verbal tests is limited to making non-lingual signs such as, 'X', '"', or other such marks to respond to the items. Examples are: Chicago non-verbal test, Army Beta test, Raven's Progressive Matrices Test, etc. Non-verbal tests are useful with young children, uneducated people or with those who use a language other than the one used in the test. However, one limitation of non-verbal test is that these tests may not be useful to assess all mental or psychological qualities of people.

Performance tests, as the name suggests, require the testee to act or perform. In these tests, language is used only to instruct the testee as to what they are required to do or perform. The items in these tests involve manual acts or problem solving activities. They typically involve manipulating objects, tracing mazes, placing pictures in the proper order, and finishing patterns, etc. These tests are used to measure traits that cannot be measured using verbal tests. Performance tests are in general individually administered test. Some famous performance tests are: Bhatia Performance Test, Porteus maze test, Koh's Block Design test, etc. Performance tests are very much useful for testing young children, uneducated person, or people with linguistic difference or problems. These tests help in identifying psychological and neural disorders, besides testing motor abilities and skills of people. However, performance tests are costly and cannot be administered in groups. Another weakness of these tests is

that their reliability is not very high.

Classification on the basis of the structure of the items:

Psychological tests can also be classified on the basis of the structure of the items. Accordingly, tests may be objective as well as subjective. Objective type tests include recall or recognition type items of multiple choice, alternate response, or other such type of items. Objective type items are generally very short and simple that demand answers in a single word or sentence. On the other hand, subjective tests include open ended questions. Unlike answers to objective items which are fixed, predetermined, and standard, answers to subjective items are not fixed or predetermined. They require the testee to answer using their subjective feelings or understanding. Objectives test items are valid, reliable, and easy to score but they cannot give much deep information about the testee. On the other hand, though subjective items are difficult to score and sometimes impossible to quantify, they can reveal deep information about the testee.

Classification on the basis of area or content of measurement:

Psychological tests can also be classified according to the area or content of measurement. For example, there are intelligence tests, achievement tests, interest tests, personality tests, etc. The Mental Measurements Yearbook, USA (published every five years) which contain information on English-language psychological test across the world uses 18 content classifications do categorize tests; they are:

- Achievement
- Behaviour Assessment
- Developmental
- Education
- English & Language
- Fine Arts
- Foreign Languages
- Intelligence and General Aptitude
- Mathematics
- Neuropsychological
- Personality

- Reading
- Science
- Sensory-Motor
- Social Studies
- Speech and Hearing
- Vocations
- Psychological Tests and Measurements

Classification on the basis of functions:

Psychological tests have also been categorized on the basis of their function. Some psychological tests are used to diagnose the present psychological conditions of individuals. For example, tests may be used to determine if the testee is suffering from behaviour or character disorder; if the testee is depressed; and the like. Such tests are called **diagnostic tests.** In education, diagnostic tests assess students' understanding of a subject, area or skill. Some other types of tests, called prognostic tests, are used to make predictions. **Prognostic tests** help to identify or categorize people with different risks of specific future conditions. In education such test predicts how well a person is likely to do in a certain school subject or task.

There are other categories of psychological tests such as selection test, placement test, test of classification, test of certification, etc. which are named after the functions they perform.

Classification on the basis of the method of Score interpretation:

Psychological tests have also been classified on the basis of how scores on a test are interpreted. When the score of an individual is compared with the scores of a group taking the same test, then that is called a norm-referenced test. Norm-referenced tests give information about the relative standing of individual in a group. In criterion-referenced tests, scores of each testee is compared to a pre-determined set of criteria or a standard rather to the other members of the test-taking group. Such tests aim to assess if the testee has the attained mastery over a certain skill or skills. These tests help in making decision about "pass" or "fail" and certification. Different board exams such as Law, Medicine, etc are examples of criterion-

referenced tests. If the examinees demonstrate mastery of the skills to practice the profession, they are certified or licensed, otherwise not.

2.7 FUNCTIONS OF PSYCHOLOGICAL TEST

Psychological testing performs many important functions in today's world. The significance of psychological testing extends far beyond the field of education alone. Psychological tests measure the ability of individuals to perform tasks in various fields such as engineering, medical, musical, reading, clerical, spatial, numerical, dextrous, and many others. Psychological tests serve both diagnostic and prognostic functions that help in educational, vocational, as well as personal guidance and counselling that help to build realistic self-image among students, set educational and vocational goals and provide important data and crucial information that help in placement and making reasonable decision about career and occupational choices. Besides, psychological tests measure academic progress of students, help in classifying students on the basis of their ability, help screening students for various courses and career, and help students to develop self-understanding and make personal decisions accordingly. The main functions of psychological testing may be explained in the following ways:

- **Diagnosis:** One of the main functions of psychological tests is diagnosis. Psychological tests diagnose the present psychological conditions of individuals. For example, a diagnostic test may be used to determine if the testee is suffering from behaviour or character disorder; or if the testee is depressed; and the like. In education, diagnostic tests assess students' understanding or skill; their possible weakness or backwardness in any subject or area.Information concerning students' strengths and weaknesses helps in making better plans about what and how to teach students.
- **Prediction:** Psychological tests can identify or categorize people with different risks of specific future conditions. Such tests are called prognostic tests. In education such test predicts how well a person

is likely to do in a certain school subject or task.

- **Providing information for formative and summative evaluation:** Psychological tests provide vital information required for conducting formative and summative evaluation. Formative evaluation is very useful in studying if a program is working or not; and if not, then why is it not working, while the program is in progress. Formative evaluation helps the program planners, designers, learners, instructors, and managers to monitor how well the program goals and objectives are being met. It helps to redress the deficiencies in the program as early as possible while the program is in process.Summative evaluation is carried out after the completion of the program to find out the overall success or failure of the program. Psychological tests of different types supply data for both, formative and summative evaluation.
- **Classification:** Psychological tests supply data for classifying individuals on the basis of various traits such as interest, aptitude, attitude, intelligence, or any other trait which is relevant for the purpose. In the educational field, classifying students with various administrative purposes is very important which is aided by data obtained from psychological tests.
- **Selection:** Psychological tests are very useful in making selection of individuals for admission, recruitment, or other activities on the basis of requisite knowledge or skills for the course or career.
- **Comparison:** Psychological testing help in making comparison between individuals on the basis of their achievement, intelligence, personality, temperament, and such other traits. Such comparisons also help to know about individual differences among people.
- **Instructional or Educational function:** Psychological tests are useful in making various instructional or educational decisions. Knowledge gained through the use of psychological tests help in making proper choice of educational and instructional objectives. They also help in making better plans for teaching learning strategies. Moreover, data obtained from tests help to improve curriculum,

assess the effectiveness of teaching methods, and evaluate the extent to which objectives have been attained. Besides, various practical and administrative decisions concerning admission, selection, comparison, prediction, promotion, etc depend on information collected from psychological tests of various kinds.

- **Guidance and counselling:** Psychological testing is indispensable for providing guidance and counselling in the areas of education, vocation, and personal life problems. Tests of interest, ability, intelligence, personality, etc are a must for any success of guidance and counselling program.
- **Research and development:** Psychological tests play important part in research and development. Various psychological tests are required to conduct research on human behaviour. At the same time, tests of various psychological traits may suggest further research leading to new discovery about human behaviour and personality. Such research may help in the development of new theories, principles, or laws to explain and understand human behaviour and personality.



CHECK YOUR PROGRESS

Q 3: Write about any two types of psychological test.

.....

Q 4: What is a diagnostic test?

.....

Q 5: Write two functions of psychological test.

.....

2.8 USES OF PSYCHOLOGICAL TEST

Psychological tests are of immense use in various fields of human activities. The important uses of psychological tests may be mentioned as under:

- Psychological tests are widely used to determine and analyse individual difference in intelligence, aptitudes, achievement, interest, attitudes, vocational fitness, non-cognitive personality characteristics and similar other traits.
- Psychological tests are used in various educational, psychological, cultural, sociological, and employment studies.
- Psychological tests are used in the study of cognitive or mental development, personality characteristics associated with age and developmental stage, sex, race, heredity and environment, intelligence, education and other factors.
- Psychological tests are used to study the nature and characteristics of the normal, the gifted, the retarded, the neurotic, and the psychotic individuals.
- Psychological tests are also used in educational planning, classification, selection, prediction, placement, promotion, evaluation, and in certification.
- Psychological tests are used in educational, vocational, and personal guidance and counselling.
- Psychological tests are used to detect and to measure the special abilities of a person.
- Psychological tests are used in clinical settings such as in mental hospitals to diagnose mental disorders. MMPI, (Minnesota Multi-phasic Personality Inventory), RISB, (Roter Incomplete Sentences Blank), etc. are examples of such clinical tests.
- Psychological tests are used in legal classification of people into different categories such as, normal and abnormal, criminal and innocent, intellectual and mentally retarded, able and disable etc.
- Psychological tests are used to diagnose factors associated with problems of learning, behaviour, attitude, or adjustment.
- Psychological tests are also used in business and industry to select, recruit, and classify personnel for placing them into different branches of job.

- Psychological tests are used in scientific research and investigation.
- Psychological tests have been continuously used in selection of military personnel since the First World War.

The forgoing discussion reveals that psychological tests are very useful in different areas of human activities such as, education, vocation, diagnosis mental disorders, and hence they affect the lives of many people significantly.

2.9 MEANING OF A GOOD TEST

A good test objectively measures what it intends to measure and gives consistent results. In other words, a good test is one that is valid, reliable, objective, practical, and friendly to the test-taker. A good test also fulfils the criteria of standardization. This implies that good tests are administered under uniform condition and scored objectively in order to make the scores obtained by individuals who take the test comparable. Procedures of administration and scoring of good tests are specified in detail in order to avoid any subjectivity. Moreover, a good test isone that has been tried out with large groups of individuals, whose scores provide standard norms or reference points for interpreting the scores obtained by those who took the test. Good tests are administered in a standard manner under uniform procedure. These tests are tested and re-tested and have been proved to produce valid as well as reliable scores. Furthermore, good test provides proper attention to the respondents to make it convenient for them. A good test looks professional but at the same time it is easy to administer.

Thus, a good test may be understood as a test administered under uniform conditions and interpreted in a consistent manner, i.e. all the key aspects of a good test are uniform. The same test is administered to all examinees, the conditions under which the test is administered (time, resources, etc.) are standardized, and the ways in which scores are interpreted are also standardized.

2.9.1 Criteria of a Good Test

Whenever we need to construct a test or to select a test from the available ones, we must see that the test has certain good points or characteristics. In this regard it is important to note that the criteria of a good test may be categorized into two categories: the practical criteria or the usability of the test, and the technical criteria. These two categories of qualities may be presented as below-

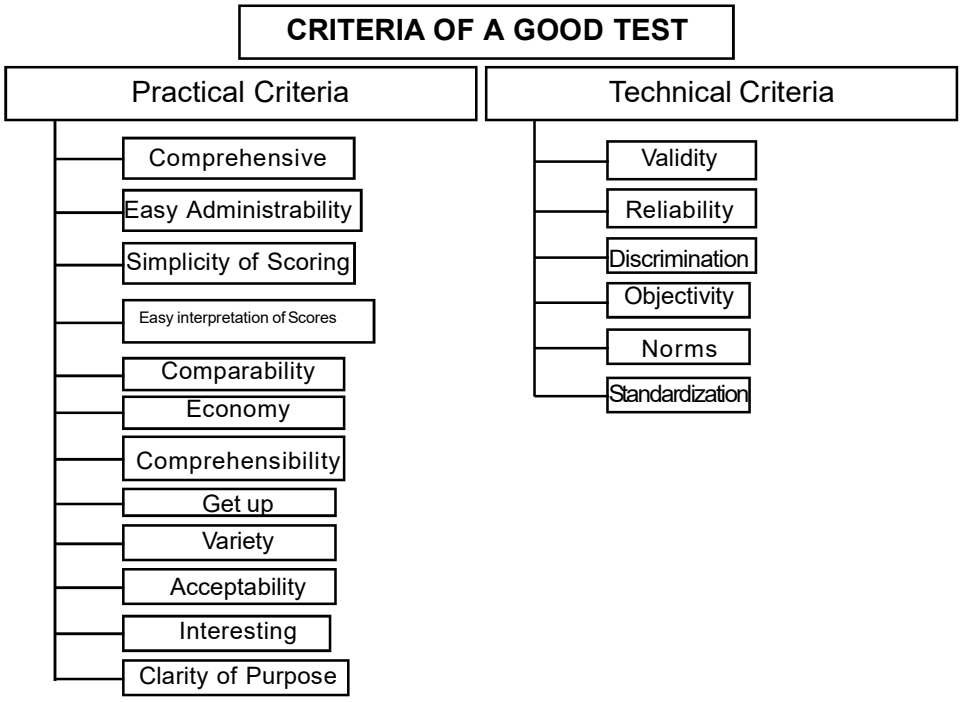


Figure 2.1: Criteria of Good test

It is important to note at this point that the practical as well as the technical criteria mentioned above are very important to make for a good test. Though, the technical criteria of a test are more important than the practical criteria, in the absence of the practical criteria a test may become unusable even if it is of technical quality. Similarly, a test which is highly practicable may not give useful results in the absence of technical qualities. Hence, both practical and technical criteria are important to make a good test.

2.9.2 Practical Criteria of a Good Test

Practical criteria of a test refer to those qualities of a test which make the administration of the test simple, smooth and convenient. The practical criteria of a good test include the following:

- comprehensive
- easily administrable
- simplicity of scoring
- easy interpretation of scores
- comparability
- economy
- comprehensibility
- get-up
- variety
- acceptability
- interesting
- clarity of purpose

A good test is comprehensive: A good test is always comprehensive enough to include items representing each of the abilities and objectives so that it can measure what it is supposed to measure. If a test does not represent all the content or curriculum and objectives of instruction, it can never claim to be a good test. In order to make the test representative and comprehensive, different types of items should find place in the test.

A good test is easily administrable: A test which can be administered smoothly with ease may be called a good test. The directions for administration of a good test are always clear and precise. The test booklet of a good test includes clear description about the necessary preparation for the administration of the test, the method of distribution and collection of test-booklets in simple and clear cut language.

A good test is characterized by simplicity of scoring: The scoring procedure of a good test must be simple. The process

of awarding marks against the responses to the test items should be simple and fast. In order to make the process of scoring simple, fast and easy, good tests should be accompanied by well-constructed 'scoring key'. Scoring keys help in fast and objective scoring of test-booklets.

Easy interpretation of scores: Scores obtained by individuals in a good test can be interpreted easily. Easy interpretation of scores can be ensured by making provision for adequate norms. The scores obtained in a test should not be such that cannot be interpreted or understood easily.

Scores obtained by a good test are comparable: If the scores obtained by different individuals who take the test cannot be subjected to comparison, the worth or value of the test becomes questionable. Good tests are administered under uniform condition and scored objectively which make the scores obtained by individuals or groups in the test comparable.

Good test are economic: A test must be economic in terms of time, money and effort required to administer, score, and interpret the test results. If a test possesses high technical qualities but is very costly, requires much time and effort, then the test cannot claim to be a good test.

Good tests are comprehensible: A good test is comprehensible or intelligible to the testee as well as testers. The items and the instructions should be clear and unambiguous. The processes of administration, scoring and interpretation of good test are easily understandable to the administrator or tester.

Attractive physical get-up: The physical get up or the cover of a good test is attractive and beautiful. The quality of paper used and the print should be of high quality.

Good tests provides for variety: Good tests include a variety of test items: multiple choice items, objective type items and so on. It also includes variety of tasks and activities to be performed by the respondents such as writing, reading, speaking, listening,

re-writing, interpreting, filling blanks, matching, distinguishing, identifying, etc. The tasks and the materials used in the tests should be related to real life situation.

Good tests are acceptable: Acceptability is another feature of a good test. A good test must be acceptable to the testee, the tester and all other concerned parties.

Good tests are interesting: Good tests are interesting to the testees. A test must be interesting in order to motivate individuals to take the test and to retain their interest till the end of the test. Uninteresting and boring tests cannot yield intended results.

Purposes of good tests are clear: Good tests are characterized by clarity of its purpose. This is one of the most important characteristic of a good test. The purpose of the test must be very clear before the testee as well as the tester.

2.9.3 Technical Criteria of a Good Test

The technical criteria of a test are very important for raising the quality of a test to a high level of standard. The technical criteria of a test include:

- validity
- reliability
- discrimination
- objectivity
- norms
- standardization

Validity:

Validity is the most important technical criterion of a good test or other measuring instrument. Cronbach says, "Validity is the extent to which a test measures what it purports to measure." This means that the validity of a test is the extent to which a test measures what it claims to measure. Validity refers to truthfulness of a test. In other words, validity answers the question of whether the test

measures what it intends to measure. The concept of validity is so fundamental that it precedes the aspect of reliability in importance. A test may be reliable but not valid. However, if a test is not valid, then its reliability has no meaning or importance. On the other hand, a valid test is usually reliable. The concept of validity is not absolute and hence validity of a test is always understood or determined with reference to the purpose of the test. Therefore a test may be valid for one purpose but not for others. Any test can be differentially valid, given the various uses to which it is put. This is why F. S. Freeman defines validity as, "An index of validity shows the degree to which a test measures what it purports to measure when compared with accepted criterion." For example, a test constructed to assess the capacity for logical thinking of adolescents may serve the purpose extremely well, but when the same test is given to students of a different age group it may fail to give desired results.

Reliability:

Reliability is another very important technical criterion of a good test. It refers to consistency of results or findings. In the words of Freeman, "The term reliability refers to the extent to which it gives consistent result on testing and retesting." When an investigation is repeated it must yield the same results if it were to be reliable. When more than one investigator or evaluator is making the measurement, all of them must arrive at similar findings in order to claim that the data are reliable. Similarly, when an individual takes the same test twice, if the scores on the two occasions are very similar then the test can be described as reliable. This means, a reliable test must give the same result when given twice to the same person within a short period of time and when different evaluators make the measurement. Anastasi says, "Reliability refers to the consistency of scores obtained by the same individuals when re-examined with the same test on different occasions or with different sets of equivalent items or under variable examining conditions." If a test or other measuring device gives different results on different occasions

or when used by different evaluators on the same individuals, then it should be understood that the test is not reliable.

Reliability of a test refers to the consistency of scores obtained by students on alternate forms or different administration of the same test. However, no two tests with exact content can ever give identical results due to differences in the environmental conditions including psycho-physical state of the test-takers. Even the same test gives different results even when administered to the same group of students at two different occasions. Nevertheless, whenever we administer two different tests with similar material or the same test on different occasions, we wish that the scores obtained by students in the two different administrations are similar. In this situation, the test is reliable to the extent to which the scores are comparable.

Reliability of a test is an indicator of validity as well. If a test cannot give consistent results, it is obvious that the test is not accurately measuring the trait or variable of interest. A test to be valid must be reliable. Therefore, estimation of reliability is considered to be the first-step in the process of validating a test. If the test is not reliable, then there is no need of examining if the test is valid and it can be easily concluded that the test is not valid. Several methods are used to estimate reliability of a test depending on the nature of the measurement.

Discrimination:

A good test must be discriminating. Tests are constructed and administered with the purpose of studying the differences among individuals or groups besides other purposes. Hence, a good test must measure differences in achievement of individuals. Tests which are discriminating can separate the good students from the poor students. In order to enhance the discriminating power of a test, it must have a wide range of scores from the lowest to the highest. Moreover, the test should have items with different levels of difficulty. In more simple words, the test should have items of highest

difficulty level, which will be answered correctly only by the best students along with very easy items that can be answered correctly by all the students. Each item of a good test must be able to discriminate between the students who know more and the students who know less. If an equal number of good as well as poor students answer an item incorrectly, the item fails to discriminate between good and poor students. If an item is answered correctly by poor students and incorrectly by good students then the item is making negative discrimination. Such items must be ambiguous and faulty and hence should be deleted readily or modified to make positive discrimination between good and bad students. Analyses of items after the administration of a test help in determining the relative difficulty and discriminating power of each item. Hence test construction must analyse items carefully and extensively so that items can be made discriminating and of proper difficulty level.

Objectivity:

Objectivity is another important technical criterion of a psychological test. A good test is always objective. Objectivity is like an important precondition to validity and reliability of a test. The scores obtained by an objective test are not influenced by the mental or physical condition of the scorer. Since the items in an objective test have only one correct answer, there is no scope for subjective influence in scoring process. Objectivity of a test has two different aspects: (i) objectivity of test items, and (ii) objectivity of scoring.

Objectivity of test item indicates that the items are very clear, straight forward, and unambiguous and each item has only one correct answer. An objective item should not have more than one correct answer in any condition or situation. Language of the test items should be simple, clear, and easily understandable. There should be clear instructions to the testees as to what they should do or how they should respond to the items. Clear instructions to the testees can ensure consistent score on an answer script even if the answers are checked by different examiners. In order to ensure

objectivity of items it should be kept in mind that ambiguous, essay type and items with unclear instructions may lead to subjectivity.

Objectivity in scoring refers to objective scoring of test booklets or answer scripts. In objective system of scoring, irrespective of the person who makes the scoring, it is possible that the same score is obtained on an answer script. In objective system of scoring, the individual judgement or subjective influence of the individual cannot influence the score. Usually a scoring key is prepared before the administration of the test in order to make the scoring process objective. The scoring key contains all the answers and marking pattern for each correct or incorrect answer to the test items.

Objective items make objective scoring possible. There is a popular allegation against the traditional essay type items of being subjective. This is because of the fact that the scoring of such items is influenced by the mood of the examiner, language and handwriting of the examinee, Halo effect, and the like.

Norms:

A good test is always accompanied by suitable norms for interpreting the scores obtained by individuals on a test and to make comparison between the scores. The crude or raw scores obtained by individuals on a test do not convey much meaning or significance. For example, a raw score of 60 obtained by a student in an examination has little meaning if information about the total marks in the examination, marks obtained by other examinees, the average score of students in the same exam, etc. remain unknown. Moreover, such a score cannot be directly compared with marks obtained by others or by the same individual in a different examination. In order to remove such difficulties and to interpret scores properly and to make the scores comparable, provision of appropriate norms is a must for a good test. A norm or a standard is the average score obtained by a homogeneous group in a test. The score obtained by an individual can be interpreted only by comparing it with the standard

or norm set for the group.

Norm is the average or the representative score of a specified population on a particular test. According to Freeman, "A norm is the average or typical score (Mean or Median) on a particular test made by a specified population." For example, Mean score of 10 year old children on a test of intelligence, Mean score of a group of students of 8th standard on a test of mathematics, etc. Reference to such norms helps to interpret and compare the score of an individual besides assigning him a relative position or rank in his group.

There are four different types of norms generally used in tests, they are:

- Age Norm
- Grade Norm
- Percentile Norm
- Standard Score Norm

Age norm for a test is the arithmetic Mean of the raw scores obtained by individuals of a particular age group on the test. For example, the Mean score of a group of 11year old children on an intelligence test is the age norm for 11 year old children for that test. The concept of age norm is very simple and it helps in making comparison between test scores of individuals of the same age group. However, the problem with age norm is that it can be applied only to tests measuring the traits or attributes that tend to grow with the growing age of people.

Grade norm for a test is the arithmetic Mean of the raw scores obtained by a group of students studying in a particular grade on the test. For example, the Mean score of a group of 10th grade students on a test is the grade norm for 10th grade students for that test. The concept of grade norm is similar to the concept of age norm, but for grade norms the average performance is determined on the basis of the grade of the students unlike age norms which is determined on the basis of age. The concept of grade norm too is

simple and it helps to compare the performance of students studying in the same grade. The main limitation of grade norm is that it does not consider the potential individual differences among students studying in the same grade and fixes one single norm for all students of a particular grade.

Percentile norm is a process of converting raw scores of individuals into percentiles. A percentile is a score below which a given percentage of individuals in a group fall. For example, the 35th percentile is the score below which 35% of the individuals lay on the basis of their scores. The advantage of percentile norm is that it is easy to calculate and can be used in any type of test. However, the main limitation of percentile norm is that it can indicate the relative position of the individual in the group only and cannot express the degree or amount of achievement acquired by the individual.

In standard score norm the raw scores of students are converted into standard scores. The conversion is done by calculating the distance of individual student's scores from the Mean score of the group in Standard Deviation units. The most commonly used formula for converting raw scores into standard scores is -

$$z = \frac{x - \mu}{\sigma}$$

Where, Z=Standard Score

X=Raw score of a student

μ =Mean of all the scores

σ =Standard Deviation of all the scores

For example, if a student scores 80 in a test and the Mean and SD of all the students in that test is 60 and 10 respectively, then the Standard score of the student would be:

$Z = {}^{80-60}\!/_{10} = 2\sigma$

This means that the raw score of 80 obtained by the student is equal to 2 or the score is 2 higher than the Mean score. Thus, the raw scores obtained by individuals may be interpreted and compared by converting them into standard scores. However, the

concept of standard score norm is not very simple and requires statistical knowledge to use it.

Standardization:

Another important technical criterion of a good test is that the test must be standardized. Standardization of a test is the establishment of uniform procedures for the administration and scoring of the test. Test standardization is the process of determining and formulating the rules for test administration, scoring and interpretation. Unless a test is standardized, it is only an informal means of measurement that varies from examiner to examiner. A standardized test is one in which all test takers answer the same questions in the same way, the conditions under which (time, resources, etc.) the test is administered are standardized, scored in a uniform manner, and the ways in which scores are interpreted are also standardized which makes it possible to compare the relative performance of individuals who took the test.

A good test must fulfil the criteria of standardization. In order to standardize the test, it is---

- administered under uniform conditions to a very large group of students,
- scored objectively using a scoring key and the scores are arranged for analysis,
- Mean and other statistical values of the scores calculated and norm for the test is determined
- validity and reliability of the test is determined, and
- finally, the test manual or guidelines for administering the test is prepared.



CHECK YOUR PROGRESS

Q 6: What is a good test?

.....

Q 7: What is Validity?

.....

Q 8: Mention two practical criteria of good test.

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2.10 LET US SUM UP

After going through the units, it can be summarized as--

- A psychological test is a set of carefully selected stimuli in the form of questions to be answered or tasks to be performed to elicit a sample of behaviour required to measure a particular psychological trait or characteristic.
- The long history of psychological testing can be traced back to the time of the Chinese emperors (around 2200 B.C.) who used rudimentary forms of tests to select officials and to examine their fitness. However, psychological testing in its modern form was initiated only during the late 1800s. During that period, physicians and psychiatrists like Hubert von Grashey, Francis Galton, Wilhelm Wundt, James Cattell, and many others contributed towards the development of modern testing system. It was Alfred Binet and his associate Theodore Simon who finally developed the first proper intelligence test in France in 1905. The original French Binet-Simon intelligence test was later adapted in the Stanford University, USA by Lewis Terman which was known as Stanford-Binet intelligence scale. German psychologist William Stern introduced the concept of Intelligence Quotient (IQ) which was to be obtained by dividing the mental age by the chronological age.
- Psychological tests are tools of indirect measurement to measure psychological variables which are abstract, unobservable, and cannot be measured directly. Moreover, psychological test always depends on samples of behaviour to make inference about the total domain of the relevant behaviour. Any score of an individual on a test is the sum of his actual ability and some errors that may result from the

test itself, faulty administration of the test, subjective influence of the examiner, psycho-physical condition of the examinee, or adverse environmental influences. Hence, the accuracy, authenticity, and exactness of a tool of physical measurement cannot be claimed by a psychological test.

- Although test, examination, and evaluation are similar terms, they have different meanings. Test and examinations are tools of evaluation, which contain a wider, more scientific, and comprehensive process. A test is a set of items or questions to be answered or tasks to be performed on a certain area or topic. An examination too, is a set of questions or tasks; however, an examination includes many areas or topics unlike a test which is focussed only on a single area or topic.
- Psychological tests can be classified by the type or nature of the behaviour they measure, the way in which they are administered, the method of their scoring, and how they are used. Hence, there is no single classification of psychological tests and the different classifications are not exclusive but they often overlap.
- The varied functions of psychological test include: Diagnosis, Prediction, Providing information for formative and summative evaluation, Classification, Selection, Comparison, Instructional or Educational function, Guidance and counselling, Research and development etc.
- Psychological tests are used to study intelligence, aptitude, achievement, and various other scholastic and non-scholastic personality traits of individuals and groups. These tests help to determine and analyse the nature of individual differences among learners in terms of intellectual development, academic and non-academic personality characteristics associated with age and sex, personality characteristics of gifted, retarded, or educationally backward, as well as the personality traits of the neurotics and psychotics.

- A good test objectively measures what it intends to measure and gives consistent results. In other words, a good test is one that is valid, reliable, objective, practical, and friendly to the test-taker. A good test also fulfils the criteria of standardization. Good tests are administered under uniform condition and scored objectively in order to make the scores obtained by individuals who take the test comparable.
- While constructing a test or selecting one from the available tests, it must be seen that the test has certain good points or characteristics. The criteria of a good test may be categorized into two categories: the practical criteria or the usability of the test, and the technical criteria.
- The practical criteria of a good test include: Comprehensiveness or broad in scope, easily administrable, simple to score, scores are easily interpretable, comparability, economic, comprehensibility, attractive get-up, provision of variety, acceptability, interesting, and clarity of purpose.
- The technical criteria of a good test include: Validity, reliability, discrimination, objectivity, norms, and standardization.



2.11 FURTHER READING

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2.12 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: A psychological test is a standardized instrument that uses a set of stimuli to elicit a sample of behaviour which reveal certain characteristics or traits in the individual who takes the test. Such sample of behaviour indirectly reveals the personality trait or characteristic which is being measured.

Ans to Q No 2: Two important features of psychological test: i) Psychological tests are tools of indirect measurement; they measure psychological variables as the variables become manifest in the behaviour of the individual. (ii) Psychological tests depend on samples of behaviour to assess, the behaviour to be measured.

Ans to Q No 3: Two types of psychological tests are individual tests and group tests. Tests which are administered to one individual at a time is called individual test. Group tests are those that are administered to a group of people at a time.

Ans to Q No 4: Some psychological tests are used to diagnose the present psychological conditions of individuals. For example, tests may be used to determine if the testee is suffering from behaviour or character disorder; if the testee is depressed; and the like. Such tests are called diagnostic tests.

Ans to Q No 5: Two important functions of psychological test are: i) classification: psychological tests supply data for classifying individuals on the basis of various traits such as interest, aptitude, attitude, intelligence, or any other trait which is relevant for the purpose; and (ii)

selection: psychological tests help in making selection of individuals for admission, recruitment, or other activities on the basis of required knowledge or skills for the course or career.

Ans to Q No 6: A good test is one that is valid, reliable, objective, practical, and friendly to the test-taker. Good tests are administered under uniform condition and scored objectively in order to make the scores obtained by individuals who take the test comparable.

Ans to Q No 7: Validity is the most important technical criteria of a good test or other measuring instrument. Validity refers to truthfulness of a test. In simple language, validity of a test may be defined as the extent to which a test measures what it claims to measure.

Ans to Q No 8: Any two practical criteria of a good test are: (i) Clarity of purpose of the test, and (ii) Comprehensiveness or broad in scope.



2.13 MODEL QUESTIONS

Short Questions (Answer each question in around 150 words)

Q 1: Define psychological test.

Q 2: Write briefly about the uses of psychological test in education.

Q 3: Distinguish between test, examination, and evaluation.

Q 4: What do you mean by a standardized test?

Q 5: What do you mean by usability of a test?

Q 6: What is the meaning of objectivity?

Long Questions. (Answer each question in around 300-500 words)

Q 1: Trace the history of psychological testing.

Q 2: Discuss the nature of psychological test.

Q 3: Make a classification of psychological tests.

Q 4: Discuss the functions of psychological test

Q 5: Write about the different uses of psychological test.

Q 6: Discuss the practical criteria of a good test.

Q 7: Define validity. What are the different types of validity?

Q 8: Discuss the different methods of estimating reliability of a test.

Q 9: What is a norm? Write about the different types of norm.

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