# UNIT 10: MEASUREMENT OF APTITUDE

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## 10.1 LEARNING OBJECTIVES

After going through this unit, learner will be able to-

- explain the meaning and nature of aptitude
- define an aptitude test
- classify different aptitude tests

- describe multiple-aptitude tests with examples
- describe specialized aptitude tests with examples
- discuss importance of aptitude tests

## 10.2 INTRODUCTION

We generally observe that some persons are said to possess a certain specific ability or aptitude in addition to intellectual ability or intelligence. Next to intelligence, aptitude is considered to be another important characteristic of an individual which can predict success in a course of study or career. It is asserted that aptitudes are related to vocational success as intelligence is related to success in life in general. By testing aptitude, we are able to know whether an individual will become a good leader, a good musician or a good teacher. Because of these specific abilities people differ from one another and within themselves in their performances in different fields. Thus, along with the measurement of general intelligence, the measurement of aptitude is also necessary because both these measures provide sufficient information about the potentialities of an individual. So, in this unit we will learn about the aptitude tests.

## 10.3 MEANING OF APTITUDE

Before thinking about aptitude tests it is obvious to know about the meaning of aptitude. The word aptitude is derived from the word **"aptos"** which means **"fitted for"**. Aptitude may be described as a special ability or capacity which helps an individual to acquire the required degree of proficiency or achievement in a specific field. An aptitude is more specific, measuring only certain aspects of functioning within a limited range. A person with a verbal ability cannot have aptitude for all the different tasks or vocations connected with verbal ability. When we speak of an individual's aptitude for a given type of activity, we mean his potentialities at present, as revealed by his performance on selected test which have predictive value. When we say Reeta has an aptitude for music we mean that her present condition or

ability reveals that there is possibility of showing proficiency in music with proper training. It is a condition, a quality, or a set of qualities in an individual of the probable extent to which she/he will be able to acquire some specific knowledge, understanding or skill in different activities under suitable training.

The most appropriate explanation of aptitude is given by **Bingham,** which is included in Warren's Dictionary of psychology. It explains aptitude as- "A condition or set of characteristics regarded as symptomatic of an individual's ability to acquire with training some (usually specified) knowledge, skill or set of responses, such as ability to speak a language, to produce music …" Bingham further describes aptitude as a measure of probabilities of success of an individual with training is certain type of situations. Bingham states that the concept of aptitude rests upon three assumptions:

- An individual's potentialities are not equally strong
- Individuals differ from one another in their potentialities
- Many of these differences are stable.

Thus, aptitude is something more than ability. It is ability combined with suitability of performance. A scholarly person having high verbal ability may not necessarily be a good teacher. Teaching aptitude depends upon not only high scholastic ability, high interest in teaching, but also some personality traits which are wanted in a teacher. Every person with high measure of scientific ability cannot prove to be a good doctor unless he possesses some further traits like perseverance, sociability, love of humanity, dexterity of fingers to perform an operation etc.

**LET US KNOW**

***Aptitude, in reality predicts what a person is fit to be:***

- *Achievement looks to the past, indicating what has been done.*
- *Ability concerns the present, indicating the powers now.*
- *Aptitude looks to the future, predicting what he may become*

## 10.4 DEFINITIONS OF APTITUDE

To explore the meaning and nature of aptitude few definitions are cited below:

- Dictionary of Education - Aptitude is defined as a "Pronounced innate capacity for or ability in a given line of endeavor such as a particular art, school subject or vocation."
- According to Bingham (1937) - "Aptitude is a condition symptomatic of a person's fitness, one essential aspect is his readiness to acquire proficiency in his potential ability and another is his readiness to develop an interest in exercising his ability."
- Freeman has defined aptitude with the following words - "An aptitude is a combination of characteristics indicative of an individual capacity to acquire (with training) some specific knowledge, skill, or set of organized responses, such as the ability to speak a language, to become a musician, to do mechanical work."
- Traxler - "Aptitude is a condition, a quality or a set of qualities which is indicative of the probable extent to which an individual may be able to acquire, under suitable training, some knowledge, understanding, or skill."
- Van Dusen has defined the term in a rather strict manner. He states. "Aptitude is a measure of the probable rate of learning which results in interest and satisfaction and is relatively specific and narrow."

## 10.5 NATURE / CHARACTERISTICS OF APTITUDES

For clear understanding of the meaning and concept of aptitude following points are needed to be mentioned regarding true nature / characteristics of aptitude:

- Aptitude is an inborn and inherent quality which finds expression through training in a particular area.
- It is influenced by both hereditary and environmental factors. Hereditary provides the potential and environment helps to find

expression to it. It remains, more or less constant.

- Aptitude is not a general ability but a specific talent needed for different kinds of job. Similarly, it is of a specific nature, as it is not common to all the situations where a particular ability is used. As it cannot be further analyzed into simpler abilities, it is unitary.
- An understanding of one's aptitude helps us to know what he can do in the future. Thus, it is a present condition but with a forward future reference.
- Aptitude is the ability to learn a variety of skills or behaviours, not the type of skills learned. A person may have no present ability to derive a car but may have an aptitude for driving-which means that he has the capacity or ability to acquire proficiency in driving -provided he receives the proper training. Thus -

**Aptitude = Ability + Probability of success**

- It is symptomatic or indicative of one's ability or potentialities for a particular job. It implies fitness and suitability for the activities in question.
- An aptitude is a unique combination of abilities and personality characteristics, which predisposes a person to do one kind of work better than another and increases his chances of success at it.
- Aptitude are pluralistic. They are not unitary trait of human personality. For example, aptitude for science involves basic intellectual qualities like logical reasoning, abstract reasoning, arithmetical reasoning, certain temperamental qualities like interest in experimentation and initiative for invention, personality characteristics like persistence and hard work. Similarly, in order to be successful architect, one must possess the cluster of abilities such as a keen sense of observation, a sense of aesthetic visual memory, abstract reasoning, and an ability to sketch free hand.
- Aptitudes are not rigidly constant.

To sum up, aptitude is thought of as a natural tendency, special ability, or capacity or cluster of abilities. Often these natural abilities are looked at in relationship to a person's readiness to learn or their suitability

for a particular career. But it cannot appear or find expression unless the environment is favorable or suitable opportunity is provided.



**CHECK YOUR PROGRESS**

**Q 1:** Write two assumptions stated by Bingham regarding concept of aptitude.

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**Q 2:** Mention two characteristics of aptitude.

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**Q 3:** Differentiate between aptitude and ability.

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**Q 4:** Fill in the blank-

Aptitude = — +—

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## 10.6 MEASUREMENT OF APTITUDE

Aptitude can be measured through a multiple evidence which includes past academic achievement of the pupil, the observation of the teacher, the hobbies selected by the pupil, the interview, self-estimate by the pupil ,a standardized aptitude test etc. The most important of the above means is the aptitude test. An aptitude test is designed to assess what a person is capable of doing or to predict what a person is able to learn or do given the right education and instruction. Such tests may be used to assess

either mental or physical talent in a variety of domains to assess academic potential or career suitability. An aptitude test is used to determine an individual's propensity to succeed in a given activity.

### 10.6.1 Meaning of Aptitude Test

An aptitude test, by definition, is any type of assessment that evaluates the talent or ability or potential of an individual to perform a specific task, with no prior knowledge and/or training. These tests assume that individuals have inherent strengths and weaknesses, and have a natural inclination toward success or failure in specific areas based on their innate characteristics.

Aptitude tests measure the degree or level of one's special ability in the same way as intelligence tests are employed for measuring one's general mental ability. Aptitude tests indicate the ability to acquire certain behaviour or skills when given opportunity. They are chiefly used to estimate the extent to which an individual would profit from a specific course or training. For example, a clerical aptitude test would be able to determine whether an individual would do well as a clerk after appropriate training and with the right motivation.

- According to Hull,- "An aptitude test is a test designed to discover what potentiality a given person has for learning some particular vocation or acquiring some particular skill.
- In the words of Bingham- Aptitude tests do not directly measure future accomplishment. They make no such pretense. They measure present performance. Then, in so far as behaviour, past and present, is known to be symptomatic of future potentialities, the test data supply a means of estimating those potentialities. The estimate is necessary in terms of probabilities only.

In education, akin to intelligence tests, aptitude tests also measure a student's overall performance across a broad range of

mental capabilities. But aptitude tests also often include items which measure more specialized abilities--such as verbal and numerical skills--that predict scholastic performance in educational programs. Similarly, the difference between aptitude and achievement tests is sometimes a matter of degree. Compared to achievement tests, aptitude tests cover a broader area and look at a wider range of experiences. Achievement tests tend to measure recent learning in particular school subjects. Aptitude tests tell us the talent or potential that a student brings to the task regardless of the specific curriculum that the student has already experienced. Some aptitude and achievement tests look a lot alike. In fact, the higher a student goes in levels of education, the more the content of aptitude tests resembles achievement tests as the knowledge that a student has already accumulated is a good predictor of success at advanced levels.

## 10.7 TYPES OF APTITUDE TESTS

There are different types of aptitude tests. Test constructors have typically used two approaches of aptitude test. The first approach is to develop integrated batteries that measure a number of relatively broad abilities (usually six to twelve). This is general aptitude test or multiple aptitude test approach. The other approach to aptitude testing is to develop individual tests for each specific ability. Thus, two types of aptitude tests usually employed in psychological testing are-

- Multiple Aptitude Batteries or General Aptitude Tests and
- Specialized Aptitude Tests.

### 10.7.1 Multiple Aptitude tests

Multiple aptitude test batteries are intended for the independent measurement of each of several kinds of mental operation and that provide a separate score for each. On theoretical level multiple aptitude approach represents an adoption of a group factors

approach to abilities. On practical level, this approach recognizes that testing time will always be limited and that specific abilities can be clustered into groups.

If there are a number of relatively broad, more or less independent, abilities, and if we want a relatively complete picture of an individual's abilities then a number of independent test will be needed. So, a test battery must contain as many tests as their abilities to be measured. A multiple aptitude test battery is used to assess the suitability of persons for different professions on the basis of scores in the relevant aptitude tests in the battery. Instead of a total score, they provide a suitable instrument for making intra-individual analysis through sectional scores. Most of the batteries of tests available for assessment of aptitude at school stage are in the form of test batteries consisting of the underlying abilities required for success in different occupations. Thus, an individual's potentialities in a number of academic and vocational areas can be analyzed or appreciated by means of a series of relatively brief tests. Some examples of multiple aptitude test batteries are -

- The General Aptitude Test Battery (GATB),
- Differential Aptitude Test (DAT),
- Primary Mental Abilities (PMA)

### 10.7.1 (a) General Aptitude Test Battery (GATB)

This battery was first published in 1947 by U.S. Employment service. This battery consists of 12 tests selected to measure nine aptitudes important for success in a wide variety of occupations. The factors covered by the GATB are as under-

- **Intelligence (G):** It is measured by the combined scores on three tests. Three dimensional space, vocabulary and arithmetical reasoning.
- **Verbal Aptitude:** It is measured by vocabulary tests of synonyms and anonyms.

- **Numerical Aptitude:** It includes both computational and Arithmetic Reasoning tests.
- **Spatial Aptitude:** It is measured by three Dimensional space test, involving the ability to comprehend two dimensional objects and to visualize effect of movement in three dimension.
- **Form Perception:** It test ability to match drawing of tools in one part, and of geometric forms in another.
- **Clerical Perception:** It requires matching of names.
- **Motor Coordination:** It is measured by simple paper-pencil test requiring the subject to make specified pencil marks in a series of squares.
- **Finger dexterity:** It test proficiency in assembling and disassembling rivets and washers.
- **Manual Dexterity:** It measures hand dexterity by using both hands and then the preferred hand, in placing pegs in a pegboard.

Two of the nine factors measured by the Tests- Finger Dexterity and Manual Dexterity utilize performance tests; the other seven factors are measured by conventional paper and pencil tests. The test requires approximately 21/2 hours of testing time. Raw scores are converted into standard scores for various aptitude measured by the tests. Norms for different groups have been prepared. Individual profile records are available for recording standard scores. It is a very good battery for vocational guidance of youth and adults.

### 10.7.1 (b) Differential Aptitude Tests (DAT)

Differential Aptitude Tests' was prepared by George K. Bennett, Harold G. Seashore and Alexander G. Wesman and published by U.S Psychological Corporation. This was comprehensive and carefully developed battery. This battery was designed to serve as an aid in the educational and vocational guidance of students in grades eight through twelve. It can also be used for unselected adults.

The test, first published in 1947 and it's another revision was published in 1972 (Form S and T). The DAT is probably the most widely used multiple aptitude battery in secondary school level. The battery consists of eight subtests of some specific abilities. Combination of such abilities is required for success in different occupations. The tests in the battery are power tests (The one exception is the clerical Speed and accuracy Test). Each test should measure level of ability. Each of the abilities represented in the battery should be independently tested. All eight tests of the battery were standardized on the same population. The battery includes the following eight tests:

- **Verbal Reasoning (VR):** This test consist of verbal analogies. It is designed to measure the subject's ability to handle verbal concepts and relationships rather than his word knowledge. Thus, verbal reasoning utilizes special form of analogies items that requires students to use reasoning rather than mere associations.
- **Numerical Ability (NA):** This test is designed to measure understanding of numerical relationship and facility in handling numerical concepts. Items are essentially computational, rather than problem solving type. Some of the items tests only proficiency in four fundamental process; others require understanding of quantitative concept and relationships.

The items on verbal reasoning and numerical ability are similar to items on general intelligence and scholastic aptitude.

- **Abstract Reasoning: (AR):** This test attempts to measure reasoning without the use of words. Abstract reasoning items measure no language reasoning ability.
- **Spatial Relations (SR):** This is the most ingenious test in the series. This test measures the ability to visualize and mentally or imaginatively manipulate concrete materials. The test presents two dimensional geometric figures (variously shaded).

The examinee selects the three dimensional figures that can be made from the two dimensional figures.

- **Mechanical Comprehensive (MC):** The test measures understanding of mechanical principles by means of a series of pictorially presented situation encountered in everyday life, involving mechanical and scientific principles. Thus, each item includes a picture illustrating a mechanical situation.
- **Language Usage Part I:** It is a spelling test in which the subject indicates the incorrectly spelled words in a list.
- **Language Usage Part II:** It consists of sentences in which the examinee is required to distinguish faculty from correct grammar, punctuation and word usage.

Language usage part I and part II are both achievement tests. These are included in the test because they represent basic skills that are necessary in so many academic and vocational pursuits.

- **Clerical Speed and accuracy:** Clerical Speed and accuracy test is the only test in the battery placing primary emphasis on speed, measuring speed of performing a single perceptual task. The subject is instructed to locate identical combinations of letters or numbers as quickly as possible. The items are intended, "approximate elements involved in many clerical jobs."

Three of the tests- Verbal reasoning, numerical reasoning, abstract reasoning- measure broad intellectual abilities. Items on verbal reasoning and numerical reasoning use materials commonly taught in U.S. schools. Administration and scoring procedures are simple and straightforward. The authors recommend administering the entire battery of eight tests so that the pattern of scores can be considered when counselling the student. Total testing time is slightly over 3 hours, with time limits varying from 6 to 30 minutes per test. Administration of total battery can prove to be costly in terms of time but one can make selective use of certain sub tests. For example, a student trying to explore whether s/he will have the required aptitude to go to engineering, may not be required to take

tests like clerical speed, language usage, grammatical or verbal reasoning tests but may be required to take numerical abstract and spatial reasoning tests. Reliability and validity of the test is high.

In many ways the DAT procedures are a model for interpretation of test scores. Normative data are presented for large representative samples of high school students with separate norm tables available for each grade (8-12) and sex grouping. Percentile equivalents of raw scores are provided for each group on each test. Percentile scores are used to plot an individual profile on a normal percentile chart. Such a profile shows the subjects relative standing on different tests, all scores being expressed in comparable units and with reference to a common norm.

### 10.7.1 (c) Test of Primary Mental Ability (PMA)

Primary Mental Ability test was developed from Thurstone pioneering research on structure of abilities. Factor analysis of intelligence had led to identification of certain mental abilities or traits by the American Psychologists. Primary Mental Abilities was the first multifactor battery. Originally, it was known as the Chicago Tests of Primary Mental Abilities published by the American Council on Education in 1941-47. Another revision of the test was published by Science Research Association. So this addition was named the SRA Primary Mental Abilities. In this revision there was three scale one for ages 5-7, another 7-11 years and the third one 11-17 years.

The current revision has five levels, with four or five tests at each grade level. The factors measured by the test include-

- **Verbal reasoning:** the ability to understand ideas expressed in words or ability to deal with words and verbal concepts.
- **Number facility:** facility in doing simple numerical tasks.
- **Spatial relations:** ability to visualize and conceptualize. The test items are various simple designs and geometric figures, differently rotated.

- **Reasoning:** ability to think logically.
- **Perceptual speed:** ability to distinguish sizes and shapes.
- **Word fluency:** ability to produce words easily.

The verbal meaning, number facility and spatial relations test reasoning at older age levels. The tests are designed to measure readiness to learn both overall and in specific courses.



## CHECK YOUR PROGRESS

**Q 5:** What is an aptitude test?

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**Q 6:** What is Multiple Aptitude tests?

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**Q 7:** Write the names of three aptitude test battery.

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**Q 8:** Mention three subtest included in GATB.

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**Q 9:** How many sub test was included in DAT?

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**Q 10:** Write the name of the only speed test of DAT.

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**Q 11:** Who prepared PMA?

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## 10.7.2 Measures of Specific Aptitudes

Multiple aptitude batteries measures abilities within the context of single, integrated test battery. But specific aptitude tests have been devised to measure the aptitudes of individuals in various specific fields of activities. In this approach the test constructor has concentrated on measuring a specific ability rather than attempting to provide a broad picture of abilities. These single aptitude tests includes test of mechanical aptitude, clerical aptitude, teaching aptitude, musical aptitude and so on. Such tests covering a group of related abilities necessary for performing in an occupation like becoming a mechanic, clerk, teacher, musician etc. Generally, these tests can be divided into the following sub-types according to the specific aptitude tested by these tests. We shall discuss the different Special Aptitude Tests under following headings:

- Mechanical Aptitude.
- Musical and Artistic Aptitude.
- Professional aptitude tests i.e. test to measure the aptitudes for profession like teaching, clerical ability, medicine, law, engineering salesmanship, research etc.
- Scholastic aptitude i.e. test to measure the aptitude for different courses of instruction etc.

Some of them are discussed below--

## 10.7.2. (a) Mechanical Aptitude Test

Mechanical ability is an ability involved in manipulating concrete objects, such as tools and in dealing mentally with mechanical movements. It is not a single unitary function. It is a comprehensive form of psycho-physical ability of an individual. It is a combination of sensory and motor capacities plus abilities such as manual dexterity, perception of spatial relations, capacity to get mechanical knowledge, comprehension of mechanical relation, mechanical reasoning and

problem solving. Tests of mechanical aptitude are designed to measure capacity and performance of higher level of organization than those of sensory motor capacity and dexterity (Freeman)

A number of tests are available for measuring mechanical aptitude some of the popular test this kind may be described below-

**(i) Stenquist Mechanical Aptitude Test :** Stenquist Mechanical Aptitude test was developed by S.L. Stenquist in 1923. It was intended to measure a person's ability to put together the parts of mechanical devices like a bicycle bell, a door lock, a mousetrap etc. The test was constructed for use with individuals covering the age range from children in the lower grades through adulthood. The test consists of three series of items. There are ten test items in each series. Total time allotted for the test was 30 minutes.

**(ii) Minnesota Mechanical Aptitude Test:** The Stenquist tests have been revised and extended at the University of Minnesota (1930) in America by G.D. Peterson. It was known as "Minnesota Mechanical Aptitude Test." This test, consisting of four sub-tests, was a test battery. The sub-tests are-

- **Minnesota Mechanical Assembly Test:** These are essentially the same as Stenquist's tests; with new ones added. Thirty three disassembled, mechanical contrivances are used. The test scored in terms of rate and accuracy of work. The test has been found useful in predicting success of junior high school boys in shop courses as well in a number of occupations such as mechanist and auto mechanist, wood worker, tool maker, iron worker etc.
- **Minnesota Paper Form board:** It this test paper form boards are presented in printed form. Each problem is composed of two or more parts of a geometric figure. (see figure) These parts when correctly assembled make a complete figure. The subject is required to identify the correctly assembled figure from among

several choices. It presents 64 problems. The test measures one's capacity to visualize and imaginatively manipulated geometric forms, to discriminate geometric patterns.

- **Minnesota Spatial Relations Test:** This test was designed in 1930. The test consists of a set of four standard form boards each of which has 58 cutouts of different forms and sizes. The subject is to make proper placing of the cutouts of the board in their correct hole in the board.
- **Minnesota Interest Analysis Test:** Interests are significant for satisfaction and success in vocational fields also. Interest measures are highly meaningful for those entering professional or skilled jobs. Thus this test is included in the battery to measure interest from mechanical point of view.

The test is used to measure speed and accuracy in discriminating sizes and shapes. It is suitable for testing adults as well as pupils in the upper elementary grades and in secondary schools. But it cannot measure mechanical nature of problem solving and capacity to manipulate small objects with precision.

**(iii) Bennett Mechanical Comprehension Test:** This test of mechanical comprehension presents mechanical problem in pictorial situation. This test is designed to measure understanding of the operation of mechanical principles in everyday situations. In this test pictures and sketches are presented to the subject. Every picture provides a mechanical problem which demands ability of comprehension of the picture situation. The subject is to answer certain questions arising out of the pictured situation.

This test has been designed with three levels of difficulties--

(1) One form is designed for use with high school students, engineering school applicants and with relatively untrained and in experienced persons.

(2) The second form is meant for use with engineering school

candidates and

(3) The third form was devised for high school girls and women.

On the whole the content of mechanical aptitude tests sample the following functions-visual motor, integration, spatial visualization, perceptional speed, manual dexterity visual insight etc. Besides some tests measure specialized information, knowledge of some particular technique, arithmetical problem solving ability, and technical vocabulary. Some of the functions are measured by means of apparatus tests, other by means of performance type materials and some others by means of paper and pencil tests.

## 10.7.2. (b) Tests of Clerical Aptitude

Clerical aptitude like mechanical aptitude is not a unitary function. This ability refers to the ability of routine clerical work. Different opinions are held regarding the term clerical aptitude. Super opines that it refers to the ability of routine clerical work. Bills points out clerical duties "include the gathering, classification, and presentation of data of all sorts, and analysis and use of these data in planning, executing and determining the results of operation." According to Bingham-clerical aptitude indicates at least four different abilities as its components. These are-

1. **Perceptual ability:** Ability to observe words and numbers with speed and accuracy.
2. **Intellectual:** Ability to grasp the meaning of words and symbols and to make correct decision regarding the questions they raise. This intellectual ability becomes increasingly indispensable as the clerical work increases in complexity.
3. **Various Mental Skills:** Ability to add and multiply, to spell correctly, to punctuate, and to use a wide variety of words and expressions.
4. **Motor Ability:** Ability to use various types of machines and tools like a type writer, duplicator, cyclostyle machine etc.

For measurement of these abilities the test materials and their functions include correct and systematic arrangements of symbols, numbers, words, letters and names, simple tests of arithmetic etc. For effective identification and measurement of clerical aptitude test materials are devised according to the nature of the clerical jobs itself. Reading, writing, shorting, checking arranging, filling, stamping, coding etc. are the activities involved in this type of test. A number of tests are available for measuring clerical aptitude.

Some popular clerical aptitude tests are--

**A. Minnesta Clerical Test:** This test measures quickness and accuracy needed in the clerical job. This test was developed by M. Andrew. There are two sub-test in the test--

(i) Number comparison and

(ii) Name comparison.

In the first the examinee is given 200 pairs of numbers, each containing 3 to 12 digits. The numbers of each pair being exactly alike in some cases and differing very slightly in other cases. The subject is required to check the pair which are alike. In the second subtest there are 200 names instead of numbers. The task is similar in both tests.

The test measures only perceptual speed and accuracy. The test is useful for distinguishing those who have promise for clerical work. A very low score on the test indicates lack of clerical aptitude, but a high score does not necessarily show positive aptitude for clerical occupations specially those involving responsibilities and variety of works. In such cases, the test result should be interpreted by considering the evidence from other sources.

**B. General Clerical Test (GCT):** This test has been designed as a general differential test for use with all types of clerical workers. This test aims at measuring three kinds of abilities considered necessary for clerical work. They are (1) Clerical speed and accuracy (2) Numerical ability (3) Verbal facility.

Its scope is wider than Minnesota clerical test. There are 9 sub-tests in this test with a working time of 40 minutes. These are- (1) Copy correction (2) Alphabetical filling (3) Arithmetic computation (4) Checking for errors in simple addition (5) Arithmetic reasoning (6) Spelling (7) Reading (8) Vocabulary (9) Grammar.

The test yields a total score as also subtest scores for clerical numerical and verbal ability. In short, clerical aptitude tests predict success in clerical and inspecting jobs, particularly routine ones. These tests might be called tests of perceptual speed and accuracy since they assess the ability to note details quickly and accurately

## 10.7.2. (c) Musical and Artistic Abilities

These tests have been devised for discovering musical and artistic talents. But a relatively small number of tests are available for assessing aptitude in music and the graphic arts. Standardized tests of both musical and artistic abilities generally assess only component skills rather than attempt to measure complex performance skills. Some of the important musical aptitude tests are described below.

**(i) Seashore Measures of Musical Talents:** These measures are based on a scientific analysis of musical hearing appreciation and performance. It is intended for use from grade 4 through the college level. It measures skills such as discrimination of pitch, rhythm, timbre loudness discrimination and tonal memory.

1. **Judgement of Rhythm:** The rhythm test requires the subject to compare two rhythm patterns and judge whether they are similar or different.
2. **Intensity or loudness discrimination:** Judging loudness of pairs of notes with gradation differences.
3. **Time discrimination:** Judging the duration of the some note sounded a second time.
4. **Tonal memory:** In this test paired tonal patterns are played to

test the ability to perceive the difference.

The test items in the battery are presented on phonograph records. The subject listens and attempts to discriminate. He is required to mark his responses on an answer form supplied to him. The test is considered unfit for testing musical talent of little children. It is also incapable of measuring all components of musical aptitude, as it measures auditory aspect.

**(ii) The Wing Standardized Tests of Musical Talent:** This test is intended for use for the ages of 8 years onwards. The wing tests measures ability for perceiving musical relationships and aesthetic choices. It has seven aspects - chord analysis, pitch change memory, rhythmic accent, harmony, intensity, phasing. The wing tests are considered to be more relevant to the selection and training of individuals in that art than Seashore tests.

## 10.7.2. (d) Measuring Aptitude for Art

Art aptitude is a complex of interest, abilities energy, perseverance traits and other uncommon factors. Two important tests of art aptitude are --

**(i) The Meier Art Judgement Test:** It is intended to measure aesthetic judgement in a "global" manner. It consists of 100 pairs of representational pictures in black and white. One picture of each pair is a reproduction of a recognized masterpiece. The second one of the pair is alike in every respect, except one, and this one differentiation involves some aesthetic quality or principle basic in all graphic art. Each individual is required to indicate his preference in each pair. The test has been standardized for junior high school, senior high school and college or adult levels.

- **Graves Design Judgement Test:** The test contains exclusively abstract designs. It has 90 items- 8 contain three designs each and the rest contain only two. The designs are executed in black,

white and grey. Some are line drawing, others are composed of squares, triangles, similar two dimensional figures and some others look like reproduction of three dimensional abstract sculpture perceptual function, rather than to make separate analysis of elements that enter aesthetic judgment.

### 10.7.2. (e)Tests of Scholastic and Professional Aptitudes

Scholastic Aptitude tests measure the scholastic aptitudes. Many scholastic aptitude tests have been developed for selection of students for admission to specific courses or professions like engineering, medicine, law, teaching etc. Examples of these tests are--

1. The American Council of Educational Scholastic aptitude test.
2. Scholastic aptitude tests in U.S.A.
3. Moss scholastic aptitude test for medical students.
4. Law School Admission Test.
5. Pre Engineering Ability Test.
6. Minnesota Engineering Analogies Test.
7. Teaching Aptitude test by Moss etc.

The main advantage of constructing specific aptitude test is that the ability can be measured more precisely. By concentrating on a single ability one can probe its various aspects in more detail. A particular specific aptitude test is usually developed for a specific purpose or situation. It is, therefore, more valid indicator of that particular situation.

But this approach has some limitations also. It may lead to over specificity and lack of generality. Thus, if a test user wishes to measure several abilities, he will have to develop his own test battery. This may require developing a new battery for each person or situation. Since different tests will have been developed on different populations, normative data will not be comparable. So there will be interpretation problems in comparing the scores of various measures.



**CHECK YOUR PROGRESS**

**Q 12:** Write the names of two -

(a) Mechanical Aptitude Test (c) Clerical aptitude

(b) Musical Aptitude Test (d) Scholastic aptitude tests

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**Q 13:** Write the name of a sub-test of Minnesota Mechanical Aptitude Test.

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## 10.8 IMPORTANCE OF APTITUDE TEST

Applicability of aptitude and its testing is quite obvious in modern world. The need and prospect of such measurement in educational and vocational guidance has been increasing day by day. Following are some of the uses of aptitude tests--

- Every individual is not fitted to any and every kind of job. Their innate and inborn abilities and aptitude should be identified and necessary training should be given for use of manpower resources in today's world of industrialization and specialization. Aptitude tests are helpful for identifying abilities.
- Students have to make decision regarding the choice of subjects as various types of courses need specific nature of abilities or aptitudes. We can use an aptitude test battery for identifying the strong and weak points of children and to help the students in the proper choice of courses, subjects and careers accordingly.
- Vocational guidance largely depends on use of different kinds of aptitude tests. Many students have different aptitudes needed for

different kind of vocations. It is necessary to identify the vocation to which they are best fitted on the basis of their aptitude.

- Aptitude tests can be used for vocational selection. With these tests we can reduce the number of probable failures among those who take up a particular job. Thus aptitude tests are used for the purpose of prediction for future success in careers.
- There are certain specialized courses such as Law, Medicine, and Engineering etc. where selection of the trainees may be considered very essential before training is given to them. Hence, students can be selected for admission to these professional courses on the basis of aptitude test results.
- Aptitude tests are used to help the students in the improvement of certain special traits. Knowing something about the aptitude level of students in a given class can help a teacher identify which students are not learning as much as could be predicted on the basis of aptitude scores.

It is thus clear that, aptitude testing is of much importance for any purposeful guidance and counselling program or entrance examination to specialized academic and professional courses or selection for specialized jobs. Aptitude tests, coupled with other criteria like I.Q. interest, aspirations, personality traits etc. can help to a greater extent in avoiding waste of human as well as material resources by placement of individuals in places and lines of work in which they are best fitted. It is important that aptitude test data must be used along with previous achievement data, present interests, leisure time activities and work habits etc. It is worth noting that it estimates future achievement in terms of probability only. Aptitude tests score only provide leads or suggestions or help in career planning and do not automatically match individuals to suitable courses or studies, and occupations.



**CHECK YOUR PROGRESS**

**Q 14:** Write three points showing importance of aptitude test.

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**Q 15:** Mention a limitation of aptitude test.

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## 10.9 LET US SUM UP

The unit can be summarized as-

- Aptitude is an innate and inborn ability which finds expression through training in various fields. The knowledge of an individual's aptitude thus, helps us to predict his/her future success in a particular field of activity, with appropriate training or experience.
- Aptitudes are related to professional and vocational success of an individual. There are different types of aptitude tests. Generally, two types of aptitude tests usually employed in psychological testing are test (a) Multiple Aptitude Batteries or General Aptitude Tests and (b) Specialized Aptitude Tests.
- Multi aptitude batteries measures abilities within the context of single, integrated test battery. The objective is to obtain a number of separate scores in order to differentiate among several abilities within each individual.
- The General Aptitude Test Battery (GATB), Differential Aptitude Test (DAT), Primary Mental Abilities (PMA) are some examples of such test batteries. Such test batteries can give comprehensive information about the relative picture of the student's specific abilities.
- But specific aptitude tests have been devised to measure the aptitudes of individuals in various specific field of activities. (1)

Mechanical Aptitude. (2) Musical and Artistic Aptitude. (3) Professional aptitude tests (4) Scholastic aptitude



## 10.10 FURTHER READING


1) Anastasi Anne (1976): Psychological Testing 4th Edition, New York: Macmillan Publishing Co. Inc.
2) Anderson, Scarvia B. Samuel Ball, Murphy, R.T. and et.al (1976): Encyclopedia of Educational Evaluation, Jessey-Bass Publishers.
3) Asthana B (2015): Measurement and Evaluation in in Psychology and Education, Binod Pustak Mandir, Agra.
4) Brown Frederick G. (1097): Principles of Educational and Psychological Testing, Holt: Rineheart and Winston, 1976.
5) Boehm, Ann E. and White, Mary Alice (1982): The Parent's Handbook on School Testing. New York: Teacher's College Press.
6) Freeman, F.S: Theory and Practice of Psychological Testing, Oxford and IBH.
7) Gronlund, Norman, E (1968): Readings in Measurement and Evaluation, Education, and Psychology, The Macmillan Company.
8) Goswami M (2010): Measurement and Evaluation in Education and Psychology, Nilkamal Publishing House, Hyderabad, 2010
9) Jensen, Arthur R.(1981): Straight Talk About Mental Tests Their Uses and Abuses Explained in No-nonsense Terms by the World's Foremost Authority, New York: The Free Press.
10) Mehrens, William A. and Lehmann, Irvin J. (1987): Using Standardized Tests in Education, Fourth Edition. New York: Longman, Inc.
11) Mehrens, William, A. and Lehmann, Irvin, J (1978): Measurement and Evaluation in Education and Psychology, Holt, Rinehard and Winston.
12) Sattler, Jerome M. (1988): Assessment of Children, Third edition. San Diego: Jerome M. Sattler, Publisher.




## 10.11. ANSWERS TO CHECK YOUR PROGRESS

**Ans to Q No 1:** Two assumptions stated by Bingham are-i) an individual's

potentialities are not equally strong, and ii) individuals differ from one another in their potentialities

**Ans to Q No 2:** Two characteristic of aptitude are-a) they are inborn and find expression through training, b) they are influence by both hereditary and environmental factors

**Ans to Q No 3:** Aptitude is something more than the ability. It is ability plus suitability of performance.

**Ans to Q No 4:** Aptitude = Ability + Probability of success.

**Ans to Q No 5:** An aptitude test, by definition, is any type of assessment that evaluates the talent/ability/potential to perform a certain task, with no prior knowledge and/or training.

**Ans to Q No 6:** Multiple aptitude test batteries are intended for the independent measurement of each of several kinds of mental operation and that provide a separate score for each. On theoretical level multiple aptitude approach represents an adoption of a group factors approach to abilities

**Ans to Q No 7:** The General Aptitude Test Battery (GATB), Differential Aptitude Test (DAT), Primary Mental Abilities (PMA)

**Ans to Q No 8:** a) Intelligence (G), b) Verbal Aptitude, c) Numerical Aptitude

**Ans to Q No 9:** Eight tests

**Ans to Q No 10:** Clerical Speed and accuracy

**Ans to Q No 11:** Thurstone.

**Ans to Q No 12:** a) Bennett Mechanical Comprehension Test and Minnesota Mechanical Aptitude Test

- Minnesta Clerical Test and General Clerical Test (GCT)
- Seashore Measures of Musical Talents and Wing Standardized Tests of Musical Talent
- Scholastic aptitude tests in U.S.A. and Moss scholastic aptitude test for medical students.

**Ans to Q No 13:** Minnesota paper form board

**Ans to Q No 14:** Helpful for identifying abilities/ to help the students in the proper choice of courses, subjects and careers / used for the purpose of prediction for future success in careers etc.

**Ans to Q No 15:** Do not automatically match individuals to suitable courses or studies, and occupations

## 10.12. MODEL QUESTIONS

**Short Questions** (Answer within 150 words)

**Q 1:** What do you mean by Aptitude?

**Q 2:** What are the uses of aptitude tests? Show your acquaintance with any one of the tests of aptitude.

**Q 3:** What is meant by special ability? Give an account of any test that is used for assessing the mechanical ability of a student.

**Long Questions.** (Answer 300-500 words)

**Q 1:** What are aptitude tests? Discuss the value of aptitude tests in the field of education.

**Q 2:** What is aptitude tests? Describe any one of the multiple aptitude test batteries.

**Q 3:** Write notes no

(a) DAT, (b) SRA: PMA

(c) Musical Aptitude test (d) Clerical Aptitude test.

**Q 4:** What are the factors involved in the clerical aptitude? Which tests can be used for measuring clerical aptitude?

**Q 5:** What tests can be used for measuring art aptitude? Discuss.

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