



सत्यमेव जयते

Government of India  
Ministry of Human Resource Development  
Department of School Education & Literacy

# Tamanna

An Aptitude Test for Senior School Students



A Joint Initiative of the

**CBSE** and **NCERT**





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# Tamanna

Try And Measure Aptitude And Natural Abilities





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## Message

Each student is unique and differs from another. Students vary in terms of their physical characteristics such as height, weight, strength as well as in their psychological attributes like intelligence, aptitude, interest, and personality. While one may be outspoken another may be submissive, some may be creative and flexible while others may be precise and specific, some may excel in expressing their views while some other may excel in reasoning with numbers. It is these variations which make each student unique and set the base for their behavioural differences in different situations.

Aptitude is one of the important psychological attributes which is useful to predict an individual's strengths. Knowing one's aptitude helps students to be aware about their specific abilities which facilitate not only the students but also their parents, teachers and school to take collaborative decision regarding students' educational and career/vocational choices.

It is heartening to note that the Central Board of Secondary Education (CBSE) in collaboration with National Council of Educational Research and Training (NCERT), has made available Tamanna: an aptitude test for students at secondary level (classes IX and X). The piloting of the test was done by Central Board of Secondary Education (CBSE) with seventeen thousand students from its affiliated schools across different parts of the country.

I take great pleasure in placing this document in the hands of students, teachers, and parents and hope that parents and teachers will encourage their children/students to take this test, so that they are able to explore and become aware of their abilities.

(Ramesh Pokhriyal 'Nishank')



सबको शिक्षा, अच्छी शिक्षा ।

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## Executive Summary

Teachers and parents play a significant role in helping children to know their aspirations, strengths and limitations. Information about a student's strengths and limitations would help parents, teachers and school administrators to extend support to students while making choices regarding educational/vocational courses as well as career-related decisions.

This Primer provides details about use of aptitude test, dimensions measured in the test, construction and standardization of the test, administration and scoring, piloting of the test by the CBSE and understanding the meaning of aptitude test scores.

**Students, teachers and parents must keep in mind that the aptitude test provides information related to the strengths of students and there is no pass or fail in this test. The test should be taken voluntarily by interested students and must not be used to impose any subject etc. on the students.**

A rigorous procedure was followed for the construction of the test. Items were developed for all the seven sub-tests: Language Aptitude (LA), Abstract Reasoning (AR), Verbal Reasoning (VR), Mechanical Reasoning (MR), Numerical Aptitude (NA), Spatial Aptitude (SA) and Perceptual Aptitude (PA). The complete test consists of: (i) Technical Manual which gives the details of construction and standardization of the test, (ii) Test Booklet which contains items related to the seven dimensions measured in the test and (iii) Guide for Teachers and Parents which consists of the features of the aptitude test, test administration and scoring and understanding the meaning of the test scores. To make the test suitable for the Indian context, norms were developed based on data collected from 5491 students tested at 11 different locations in different regions of the country. Two Videos have been developed to help school principals and teachers become familiar with different aspects of aptitude test. The piloting of the aptitude test was done by the CBSE with 17,500 students studying in classes IX and X through its affiliated schools across different parts of the country.

School Principals can download the soft copy (PDF) of the Test Booklet and Manual from the following links and use as per the provided instructions. All these links are also available on the Shagun Online Junction (<http://seshagun.gov.in/>) of the Department of School Education and Literacy (DSE&L), Ministry of Human Resource Development (MHRD), Government of India.

1. DIKSHA portal: <https://preprod.ntp.net.in/ncert/>
2. CBSE website: <http://cbse.nic.in/>
3. NCERT website: <http://ncert.nic.in/>

To obtain the scoring key the School Principals are required to send a request mail to: [tamanna.ncert@ciet.nic.in](mailto:tamanna.ncert@ciet.nic.in). Soft copy of the scoring key will be provided by return mail.

Scoring, analysis and interpretation may be done as per the details provided in the 'Guide for Teachers and Parents'.





# INDEX

S.No	Particulars	Page No.
I.	Introduction	04
II.	Dimensions Measured by the Aptitude Test	06
III.	Construction of the Aptitude Test	08
IV.	Standardization of the Aptitude Test	12
V.	Piloting of the Aptitude Test by CBSE	13
VI.	Administration and Scoring	14
VII.	Understanding the Meaning of Test Scores	17
VIII.	Report Sheet : An Illustration	18
IX.	Sample Test Items	21

## Introduction

Aptitude is thought of as a natural tendency, special ability, or capacity or cluster of abilities. This natural tendency determines person's readiness to learn or acquire a skill or their suitability to pursue a particular career. Aptitude is one specific ability or a combination of specific abilities such as verbal reasoning, numerical aptitude, abstract reasoning, etc. It helps the person to make educational and career choices and to decipher the career options that is best suited to one's capabilities. Knowledge of aptitude helps a person to make best fit choices about career related decisions. Students with the help of aptitude test can look forward to career guidance and counselling.

Aptitude is considered as an inborn tendency but environment also plays a significant role in the development of aptitude. An individual's performance on a task depends on intrinsic factors such as personality characteristics, motivation, ability, etc. and on extrinsic factors such as cultural exposures, environment stimulation, family environment, quality of education, etc. For example, a person has the ability to be an engineer but due to lack of support from the school and home environment she/he may not be able to explore this occupation and may not get appropriate training in the same field. As a result, despite having an aptitude a person may not get supportive environment/proper training in that area.

### Use of Aptitude Test

The aptitude test result offers factual information about a student's specific abilities which helps the student, her/his parents and the school to take a joint decision regarding the students' educational and career choices.

Self-awareness of one's aptitude at the secondary stage acts as an instrument for students to get motivated and take appropriate steps in strengthening their specific abilities. When the aptitude test result of a student is seen vis-a-vie her/his achievement records in a discipline, it may help the student to seek curricular guidance. The aptitude test result also encourages students to explore career pathways and occupations. This helps to broaden their horizon about the world of work and also encourages students to open up to new avenues of occupation (which they and/or their family may not be aware of).

At the senior secondary stage, students are at the verge of entering either higher education professional education with the purpose of entering some field of employment in future or world of work. Aptitude test results at this stage help students to revalidate their choices and thus take suitable decision to continue or change her/his educational/discipline choice that was made while entering the senior secondary stage. A re-look at their occupational aspirations/goals in relation to their specific aptitudes helps to review the efforts being made by them to achieve such goals.

Therefore, aptitude test result at the secondary stage provides information which gives ample time to the students to indulge in self-exploration and self-preparation in academics as well as in exploring the world of work so that they are able to make well-informed career choices. At the senior secondary stage aptitude testing will either reconfirm that a student is progressing on the most appropriate academic and career pathway as per her/his potential or need to change the academic and/or career choices which were made earlier and undertake new exploration as suited to her/his present ability profile.

## Dimensions Measured by the Aptitude Test

This Aptitude Test covers seven dimensions: Language Aptitude (LA), Abstract Reasoning (AR), Verbal Reasoning (VR), Mechanical Reasoning (MR), Numerical Aptitude (NA), Spatial Aptitude (SA) and Perceptual Aptitude (PA). Operational definition of these dimensions are given below:

### 1. Language Aptitude (LA)

Language aptitude is concerned with a person's ability to use and understand written language. This sub-test assesses how well a student understands English words and their synonyms, spells words correctly and identifies the correct meaning of the given proverbs/idioms.

This aptitude is prominently useful in success in educational and vocational related performances. Language aptitude is more relevant in courses and for occupations involving reading and writing such as teaching, journalism and media studies, advertising, law, library science, stenography, business development, etc.

### 2. Abstract Reasoning (AR)

Abstract reasoning refers to a person's ability for logical and analytical thinking. This sub-test is non-verbal and it assesses how well students can reason and logically relate geometric shapes or designs. In this sub-test, set of figures are given in a certain sequence and students are required to infer the next figure in the series.

Abstract reasoning is important for courses and occupations concerned with mathematics, computer programming, architecture, law, medicine, economics, mechanics, forensic science, etc.

### 3. Verbal Reasoning (VR)

Verbal reasoning is the ability to understand and reason using concepts expressed in words. It evaluates a student's ability to think constructively with words. In this sub-test, verbal reasoning is assessed by the ability to understand concepts and relationships that are underlying a word pair and then finding the missing word in a pair with similar concepts and relationships.

Verbal reasoning has been found to be relevant for courses and occupations like psychology, speech therapist, auctioneering, advertising, linguistics, business, law, education, public relations, marketing, journalism, etc.

### 4. Mechanical Reasoning (MR)

Mechanical reasoning refers to a person's ability to understand and apply mechanical concepts and principles to solve problems. In this test, mechanical reasoning is assessed by items covering the areas of acceleration, pressure, energy transformation, work and power, levers, pulleys, screws, springs, tools, etc. Item focuses on reasoning rather than special knowledge.

Mechanical reasoning ability has been found to be important for courses and success in courses and occupations concerned with machinery/electrical/civil/ automobile engineering, carpentry, electrician, machine operator, physics, chemistry, etc.

## 5. Numerical Aptitude (NA)

Numerical aptitude refers to understanding numerical relationships and applying the same to the issue/problem. It is related to a student's ability to do mathematical operations quickly and accurately. This sub-test assesses how well a student is able to solve problems covering four primary arithmetic operations like addition, subtraction, multiplication and division. At the same time, it also covers areas like ratio, percentage, square and square root, cube and cube root, number sequence, factorization, linear equation, work and speed, etc.

Numerical aptitude is relevant for success in courses and occupations related to all types of engineering, architectural, oceanography, geology, meteorology, biosciences, health sciences and of course statistics and natural sciences.

## 6. Spatial Aptitude (SA)

Spatial aptitude is related to the capacity to mentally manipulate actual materials through imagining. A student in this ability test is required to quickly judge how an object would look like when constructed in a given way. In this sub-test, spatial aptitude is assessed through items in which the need is to determine quickly how the figure will look like when seen through a mirror and how a figure will look like when folded in a particular way.

Spatial aptitude is needed in all such courses and occupations that require an individual to visualise objects in 3-dimensions, such as in manufacturing industry, drafting, designing (fashion, interior, toys and games, jewellery, urban planning, landscape designing, etc.), architecture, astronomy, chemist, visual arts, animation, multimedia art, etc.

## 7. Perceptual Aptitude (PA)

Perceptual aptitude refers to a person's ability to quickly, accurately and meaningfully compare visual information, i.e. letters, numbers, objects, pictures or patterns. In this sub-test, perceptual aptitude assesses how the students rapidly compare the paired groups of letters or numbers and identify the similarity or differences.

Perceptual aptitude helps the students to meet the classroom and day-to-day standards of neatness, speed and precision in their work. It is relevant for occupations concerned with bank-teller, accountants, computer programmers, police detectives, data entry, assembly work, record keeping, dispatching, filing, etc.

# Construction of the Aptitude Test

## Construction of the Aptitude Test

The following procedure was followed in the development of the aptitude test.

### 1. Preparation of Items

Items were generated related to the seven dimensions of aptitude. The items were written in English language.

- 1.1 **Language Aptitude (LA):** The language aptitude sub-test intended to measure the student's ability to choose correct synonym, detect errors in spellings and find out the right meaning of proverbs. The item types used in synonyms were selected for their common usage in everyday vocabulary.
- 1.2 **Abstract Reasoning (AR):** The abstract reasoning sub-test intended to check the student's reasoning ability through non-verbal measures. The items are presented in the series of abstract patterns presented in each problem which requires understanding and finding out the basic/operating principles in the changing pattern/diagram logically. The patterns/figures/diagrams which were selected are clear and large to rule out/avoid visual acuity and visual discrimination errors. Complexity of items or level of difficulty is acquired through increasing conceptual difficulty.
- 1.3 **Verbal Reasoning (VR):** The verbal reasoning sub-test aimed at the evaluation of student's ability to find out the relationship between pair of words to generalise and think logically and constructively, rather than simply recognising word fluency or vocabulary. In this test, items were developed in the form of analogy which is considered the appropriate for measuring reasoning ability. In part-I, simple one word analogy was used where as to increase the complexity, in part-II double ended analogy was used where the first and the last terms were missing. The student needs to choose from the pairs of words the one pair that best suits/ completes the analogy. The usage of this type of items in versatility and provides a good measure of reasoning which is complex and requires real thinking to find the correct response to each items. The words used in these items were chosen from literature, social sciences and science so that the item measures the student's knowledge and his/her ability to abstract and generalize relations which is known to him/her through his/her knowledge.
- 1.4 **Mechanical Reasoning (MR):** The mechanical reasoning sub-test intended to measure the student's ability to understand the basic principles of physical sciences and mechanical concepts. In this, test items consist of a pictorial figure with a simple worded question.

**1.5 Numerical Aptitude (NA):** The numerical aptitude sub-test items was designed to check the understanding of numerical relationship and numerical concepts. The items were framed in such a way that the test measures arithmetic computation rather than arithmetic reasoning. This was done to avoid the usage of language element in understanding arithmetic reasoning

problems where reading ability of the student play an important role and hence affects understanding.

**1.6 Spatial Aptitude (SA):** The spatial aptitude sub-test items was devised to measure the student's ability to visualize and imagine how an object would appear if rotated and folded in various ways and to visualise a constructed object from a pattern of picture. The items devised require mental manipulation of objects in three dimensional spaces. The patterns and drawings are large and clear, ruling out the errors of visual discrimination or perception. Perception of drawings and patterns is easy without any ambiguity. The student needs to choose only with the judgements of how the objects would look if constructed and/or rotated/folded. During the item development, it was ensured that minute differences in size don't determine/affect the answers. Student's answers will be correct if s/he has the ability to imagine the construct/rotated/folded object.

**1.7 Perceptual Aptitude (PA):** The perceptual aptitude test items intended to measure speed and accuracy of response in a simple perceptual task. The items were designed with simple letters/numbers/letter-number combinations which are same in digits (8) throughout the test. The student must select the exact same letters/numbers/combinations from given four options. Little or no intellectual ability required, as the tests' objective is to measure speed and accuracy of perception and response. It was ensured that items which were clear-cut and self-explanatory were retained.

## 2. Expert Opinion

After the construction of items, they were shown to experts in the field. The items were modified, discarded and language was changed. This helped in obtaining expert validation.

## 3. Pilot Testing of the Aptitude Test

The test was administered to students (N=86) studying in IX grade in Kendriya Vidyalaya, R.K. Puram, Sector-2, New Delhi. The main objectives of pilot testing were to know:

- whether the items elicit desired response?

- whether the items elicit varied response?
- whether the diagrams and language are understood by the students?
- whether the order of presenting the different sub-tests is conducive?
- what are the difficulties faced by the students and examiner/tester?
- what is the average time taken to complete the different sub-tests?
- whether students face difficulty in filling OMR sheets?

Based on the findings of the pilot testing, some changes were made in the instructions, language of sentences, words, etc. The following changes were made in items across the seven dimensions of the test:

### 1.1 Language Aptitude (LA)

Difficult and ambiguous words were deleted. Also some changes were made in distractors. Thus from 15 synonyms, 10 were retained; 15 spelling items were retained and 10 proverb/idiom type items were retained.

### 1.2 Abstract Reasoning (AR)

Patterns which were ambiguous where rules were not clear or have different meaning for different test takers were removed. 30 such items/patterns/figures which were large, clear with the obvious differences were retained.

### 1.3 Verbal Reasoning (VR)

It was ensured that 30 out of the 38 items used in this test were simple and the content was reasonably familiar to the student.

### 1.4 Mechanical Reasoning (MR)

Out of the 34 items, only 30 test items which were retained were simple and frequently used in students' day to day life rather than known through textbook knowledge.

### 1.5 Numerical Aptitude (NA)

Items which were complex to measure handling of the numerical concepts were removed and 30 items were retained.

### 1.6 Spatial Aptitude (SA)

Only those items which were unambiguous and easy to understand were retained.



## 1.7 Perceptual Aptitude (PA)

20 items which were higher in difficulty level were replaced to obtain total 60 items each having 8 digits.

## 4. Final Version of the Aptitude Test

The final version of the Aptitude Test consists of 7 dimensions. The total number of items across the dimensions are as follows:

**Number of Items across the Dimensions**

S. No.	Dimensions	No. of Items
1	Language Aptitude (LA)	30
2	Abstract Reasoning (AR)	30
3	Verbal Reasoning (VR)	30
4	Mechanical Reasoning (MR)	30
5	Numerical Aptitude (NA)	30
6	Spatial Aptitude (SA)	30
7	Perceptual Aptitude (PA)	60

## Standardization of the Aptitude Test

The standardization of Tamanna: Aptitude Test is based on the scores of 5491 students tested at 11 different locations in different regions of the country. The sample included school students studying in classes IX and X. Five different types of schools i.e. Kendriya Vidyalayas, Navodaya Vidyalayas, Demonstration Multipurpose Schools (RIEs), CBSE affiliated and State Board affiliated schools in Delhi, Ajmer, Jammu, Lucknow, Gurgaon, Noida, Mysuru, Bhubaneswar, Ranchi, Shillong and Bhopal.

### Reliability

The reliability estimates were derived using the methods of Split-Half Reliability, Spearman-Brown Coefficient and Guttman Split-Half Coefficient as measures of internal consistency. As PA is purely a speed test, the measures of internal consistency were not calculated for this sub-test. Since all the sub-tests have time limit, reliability coefficient using correlation for test-retest reliability have also been derived.

### Validity

Face validity of the items was established by experts. To establish concurrent (convergent) and predictive validity, Aptitude test scores were correlated with (i) David's Battery of Differential Abilities (DBDA), and (ii) Academic Achievement.

### Norms

The meaning of raw scores is better understood when it is converted into a standard score. The standard score used in the present test is Sten score. The norms were calculated based on the information collected from 3452 students of standard 9th and 2039 students of standard 10th across different parts of the country. The norms are provided for standard 9th and 10th - combined and separately for girls and boys.

## Piloting of the Aptitude Test by CBSE

1. The piloting of the aptitude test was done by the CBSE through its affiliated schools across different parts of country in 2018-19.
2. A total of 17,568 students studying in classes IX and X undertook the test.
3. Performance of students on all the seven sub-tests of aptitude test and their achievement scores in Mathematics, Science and Social Science was shared by CBSE.
4. The predictive validity was established of the Aptitude Test by correlating students performance on different sub-tests with their academic achievement. The sub-tests correlated significantly with the academic subjects.

## Administration and Scoring

### *General Guidelines for Test Administration*

There are seven sub-tests for administration. Specific and detailed instructions for each aptitude sub-test are provided on the booklets of the respective sub-tests. As the test measures the individual's inherent potentials/abilities, care needs to be taken to adhere to the timings mentioned on the booklet for each sub-test (10 minutes each so total time is  $10 \times 7 = 70$  minutes). In addition to the instructions for each sub-test, some important points regarding the aptitude test should be kept in mind:

1. Remember that this test is to help know the capabilities (special abilities) of an individual and not to label or find her/his weaknesses.
2. While introducing the test, it is important to encourage and motivate the students to do their best and tell them about the importance of the test. After all, finding an individual's strengths/ aptitude would help her/him to find careers best suited for her/him.
3. Scheduling testing when students are fresh and alert and conducting them in a non-interfering and conducive environment yields best results.
4. A 15 minutes break can be given after 4 sub-tests to ensure continued interest of the students and avoid monotony.
5. In order to bring out the true aptitude/potential of the student, maintaining strict discipline is important. To avoid copying, you can ensure that only one child sits at one desk.
6. Prepare well in advance about the procedure of the test, by familiarization with test material, timings of the sub-tests and ensuring conditions such as well-lighted, ventilated and comfortable room are present along with minimum distractions and interruptions.
7. Reassure the students that they are not expected to get every question/item correct. There is no pass and fail. However to know their strengths, they have to try to do as many questions as possible within the time limit given. There is no negative marking.
8. Ask the students to write their name, age, gender, class and school on their answer sheets.
9. Read the instructions given on the test booklet aloud, clearly and slowly and ask the students to read the same instructions silently. For each test say,

*Read the instructions for this test to yourself as I read them aloud.*

After reading the example, give a pause to allow the students more time to think about them and let them do practice item given in the each subtest in order to ensure that they understand and be mentally prepared for solving the kind of questions the specific subtest has

10. After giving the complete instructions, ask the students,  
*Is there any doubt or question before you begin?*  
Clear their question or doubt if they have any. They are allowed to read the instructions again but no new examples should be given or explained.
11. After ensuring that the students have understood the instructions clearly, ask them to start by saying,  
*Turn the page and you can begin the test now.*
12. As soon as the students begin, start the stop watch and begin timing. When the time is up, announce in a firm and loud voice,  
*Stop working now. Put your pencils down and turn the booklet immediately.*
13. Stress the importance of directions such as Do not turn the page until you are told to do so. These need to be followed strictly. Invigilation should be done quietly and ensure that students follow the instructions.
14. Ensure that students mark only one box for an item because if more than one box is marked, it will not be counted. Encourage students to answer a question by choosing the best option among the options given. If they do not know the right answer for a particular question, ask them to try to narrow down the choices as much as possible and then put in their best guess.
15. At the end, make sure that every student has handed over the test booklets and their respective answer sheets.

## Test Material Required for Administering the Test

### Test booklets

There are total seven sub-tests contained in a single booklet of the Aptitude Test.

The seven sub-tests are as follows:

- Language Aptitude (LA)
- Abstract Reasoning (AR)
- Verbal Reasoning (VR)
- Mechanical Reasoning (MR)
- Numerical Aptitude (NA)
- Spatial Aptitude (SA)

- Perceptual Aptitude (PA)

The test booklets are reusable. To avoid writing or marking in the test booklets by students, clear instructions need to be given to students and discipline should be maintained. After each use, check the test booklets and erase any marks or writing, if found. If the marks or writing cannot be erased, the test booklets should be discarded and should not be used for the next time.

#### *Answer sheets*

Answers have to be marked on the separate answer sheets provided with the test booklets. These can be scored by hand or by computer. The answer sheets need to be handled with care and should not be folded or torn.

#### *Pencils*

Each student must have at least two pencils with eraser and the teacher/examiner should have extra pencils.

#### *Scoring keys*

Keys are given for manual scoring.

Scoring is an important part of the standardization procedure. The Aptitude Test manual provides scoring keys with correct answers for each sub-test along with general guidelines which need to be kept in mind before starting the scoring procedure. These include ensuring that the student has marked only one correct answer, making sure that the student has attempted maximum number of responses within the given time and excluding answer sheets which show clear/obvious answer patterns which indicates the casual attitude of student while attempting the answers.

### **Note for Teachers and Parents**

Many students may not score high on any of the seven sub-tests. This does not mean that they lack the ability to pursue further education or training in courses to choose a career. Such students need assistance/opportunities to understand themselves through self-exploration and encouraging participation in various school activities of their interest, in addition to subjects of study. Accordingly, s/he needs assistance in knowing future courses and occupations to make the best suitable career choices. To help such students, educational and career planning sessions may be organised and they may also be referred to school counsellor for career counselling.

## Understanding the Meaning of Test Scores

To know how a student has performed on different sub-tests of aptitude test, an estimate of her/his standing among students of the same class is required.

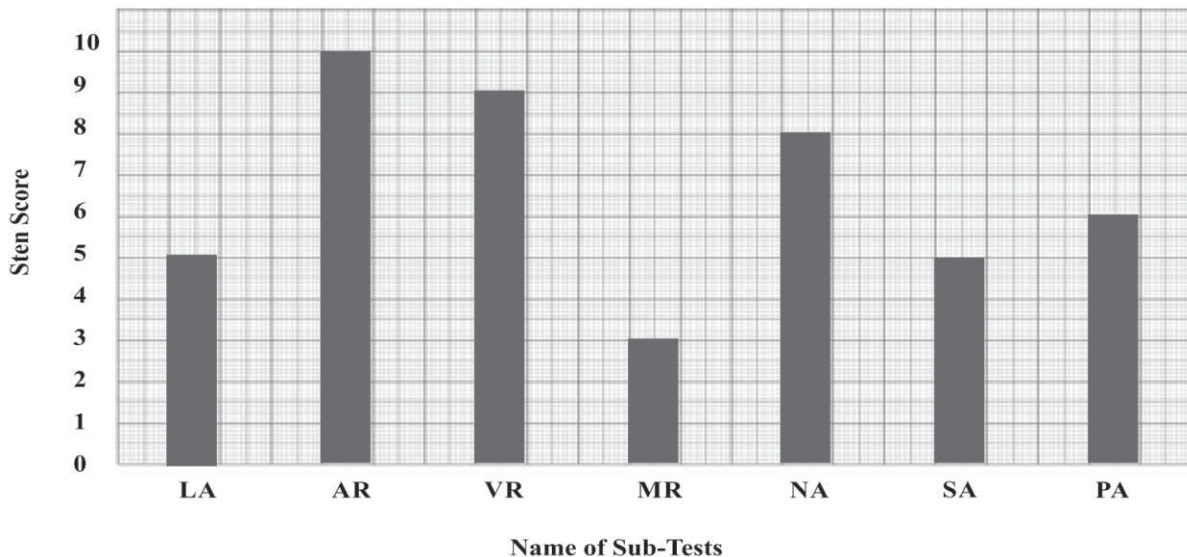
1. The total score obtained on each sub-test will become meaningful when converted to a standard score, which is called the "Sten Score". These are in the range of 1 to 10 and are given as Norms Tables.
2. To convert the score obtained on a particular sub-test into Sten score, the relevant Norms table will be consulted depending on the class and gender of the student.
3. Record in Aptitude Test Report Sheet, the student's score on all sub-tests, its corresponding Sten scores and description of Sten scores.
4. Plot the sten scores obtained on the seven sub-tests on the graph given in the Aptitude Test Report Sheet.
5. Now identify those aptitudes in which the student has scored high. This can be clearly seen in the Aptitude Test Report Sheet.

High aptitude in a sub-test may be used to facilitate exploring of courses and occupations/careers related to that particular aptitude.

## Report Sheet: An Illustration

Name : Manju  
 Class : IX  
 Gender: F  
 School : G.S.S. School, New Delhi

S. No.	Sub-Test	Score Obtained	Sten Score	Performance		
				High	Average	Low
1.	LA	15	5		✓	
2.	AR	27	10	✓		
3.	VR	25	9	✓		
4.	MR	6	3			✓
5.	NA	19	8	✓		
6.	SA	11	5		✓	
7.	PA	43	6		✓	



### APTITUDE PROFILE

#### Suggestions/Remarks

Since Manju's score/profile indicates high aptitude for Abstract Reasoning, Verbal Reasoning and Numerical Aptitude, she is likely to do well in subjects like Computer Science, Economics, Mathematics, Accountancy, Graphics, Graphics Design, Psychology, Legal Studies, etc.



Depending on her interest and inclination, she may explore courses and occupations related to Computer Graphics, Animation, Accountancy, Pharmacy, Marketing, Research/Financial/Economic Analyst, Law, Social Work, Psychotherapists, Public Relations, etc.

**Aptitude test scores obtained are suggestive and should not be used as the only deciding factor for choosing subjects by students.**

## Some Occupations and Related Aptitudes

1. **Banker**
  - Numerical Aptitude
  - Abstract Reasoning
  - Perceptual Aptitude
2. **Beautician**
  - Language Aptitude
  - Spatial Aptitude
  - Verbal Reasoning
3. **BPO Associate**
  - Language Aptitude
  - Perceptual Aptitude
  - Abstract Reasoning
4. **Computer Programmer**
  - Numerical Aptitude
  - Perceptual Aptitude
  - Abstract Reasoning
  - Verbal Reasoning
5. **Dietician**
  - Abstract reasoning
  - Language Aptitude
  - Spatial Aptitude
  - Numerical Aptitude
6. **Graphic Designer**
  - Spatial Aptitude
  - Perceptual Aptitude
  - Numerical Aptitude
  - Abstract Reasoning
7. **Jewellery Designer**
  - Spatial Aptitude
  - Perceptual Aptitude
  - Language Aptitude
  - Numerical Aptitude
8. **Journalist**
  - Language Aptitude
  - Verbal Reasoning
9. **Laboratory Assistant**
  - Abstract Reasoning
  - Numerical Aptitude
10. **Lawyer**
  - Verbal Reasoning
  - Language Aptitude
  - Abstract Reasoning
  - Numerical Aptitude
  - Perceptual Aptitude
11. **Optician**
  - Numerical Aptitude
  - Perceptual Aptitude
  - Spatial Aptitude
12. **Pilot**
  - Abstract Reasoning
  - Perceptual Aptitude
  - Spatial Aptitude
  - Numerical Aptitude
  - Mechanical Reasoning
  - Language Aptitude
13. **Retail Manager**
  - Language Aptitude
  - Perceptual Aptitude
  - Abstract Reasoning
  - Numerical Aptitude
14. **Teacher**
  - Language Aptitude
  - Verbal Reasoning
  - Abstract Reasoning
  - Perceptual Aptitude

## Sample Test Items

### I. Sub-test: Language Aptitude (LA)

Language aptitude (LA) assesses student's ability to understand English words and their synonyms, spell words correctly and identify the correct meaning of given proverbs/idioms. This sub-test consists of three parts - Part I, II and III.

#### Sample Item 1

**MEMORABLE:** A. Unforgettable B. Interesting C. Attractive D. Eventful

In the above item, note that MEMORABLE and UNFORGETTABLE mean the same thing. Therefore, the right answer is "A".

#### Sample Item 2

A. Goverment B. Government C. Gorment D. Govenmant

Out of the four options given, the word 'Government' (option 'B') has been spelt correctly, therefore, the right answer is option "B".

#### Sample Item 3

**Cry over spilt milk.**

- A. Getting out of difficulty.
- B. Holding hatred against someone.
- C. Complaining about a loss from the past.
- D. Anticipating about the future and crying.

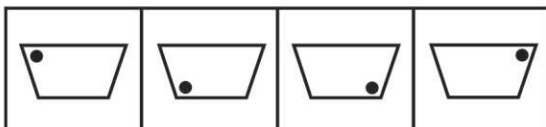
Since 'Cry over spilt milk' means about the same as complaining about a loss from the past, hence, the right answer is "C".

### II. Sub-test: Abstract Reasoning (AR)

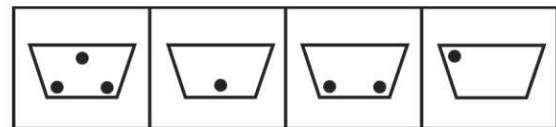
Abstract reasoning (AR) assesses student's ability to reason and logically identify sequence in geometric shapes and designs.

#### Sample Item 1

**Problem Figures**



**Answer Figures**

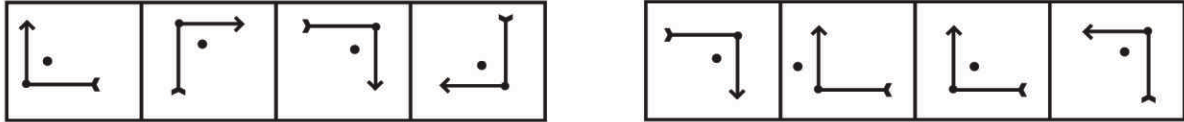


In the above item, note that each of the four problem figures has a shape with a dot. As you can see the dot in the problem figures moves anti-clockwise. So, the correct option in the answer figure would be the one in which the dot shows the next anti-clockwise position.

## Sample Item 2

Problem Figures

Answer Figures



In the above example, note that each of the four problem figures has two lines and a dot. As you can see, lines and the dot in the problem figures move clockwise. So, the correct option in the answer figure would be the one in which lines and the dot show the next clockwise position.

## III. Sub-test: Verbal Reasoning (VR)

Verbal reasoning (VR) assesses student's ability to understand and reason concepts and relationships as expressed in words. This sub-test has two parts - Part I and II.

### Sample Item 1

Water is to Tank as Money is to \_\_\_\_\_

- A. Spend      B. Bank      C. Gold      D. Manager

The relationship between Water and Tank is that water is stored / saved in a tank. Similarly, money is saved in a bank. Therefore, the right answer for this item is "B".

### Sample Item 2

\_\_\_\_\_ is to Red as Earth is to \_\_\_\_\_

- A. Mars ..... Blue      B. Jupiter ..... Orange  
 C. Mercury ..... Brown      D. Saturn ..... Yellow

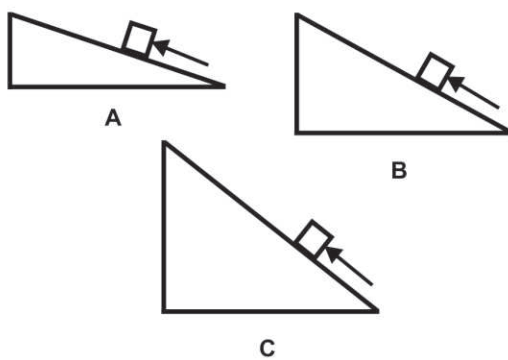
Mars is known as the 'Red Planet' because of its Red Soil and Earth is known as the 'Blue Planet' because of water in the oceans. Therefore, answer to this item is "A".

## IV. Sub-test: Mechanical Reasoning (MR)

Mechanical Reasoning (MR) assesses student's ability to understand and apply mechanical concepts and principles to solve problems.

### Sample Item 1

A wooden block is pushed upwards by applying force as shown in figures A, B and C. In which figure, the force needed to be applied would be maximum?



CBA. Figure A

B. Figure B

C. Figure C

D. Equal force in all situations

In this item, the slope of the inclined plane is maximum in C. Therefore, it would require more force. Hence, the right answer is "C".

## V. Sub-test: Numerical Aptitude (NA)

Numerical Aptitude (NA) assesses student's ability to understand numerical relationships and applying the same to problems in hand quickly and accurately.

### Sample Item 1

What will come in place of '?' in the following question ?

$$4656 + 1244 = ?$$

A. 6000  B. 5950  C. 5900  D. 7600

Adding 4656 and 1244 together, we get 5900. Hence, in this item, right answer is "C".

### Sample Item 2

What is the value of five times of square of 2 ?

A. 10  B. 20  C. 4  D. 16

The value of five times of square of 2 gives us the answer as 20. Therefore, right answer is "B".

### Sample Item 3

What is the value of 80% of 20 = ?

A. 20  B. 16  C. 1600  D. 24

The value of 80% of 20 gives us the answer as 16. Therefore, right answer is "B".

## VI. Sub-test: Spatial Aptitude (SA)

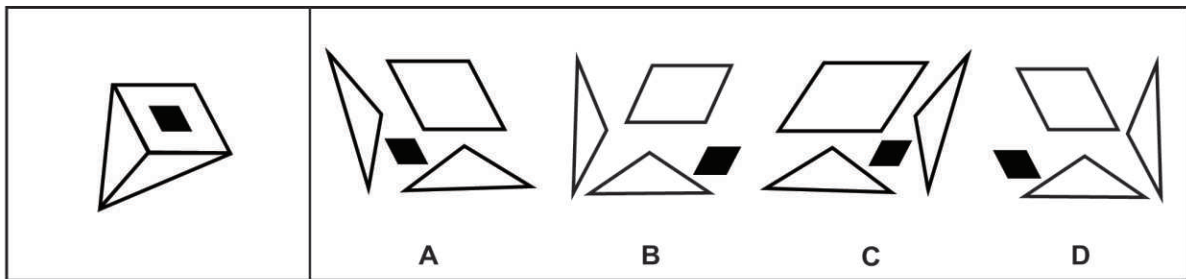
**Spatial Aptitude (SA)** assesses student's ability to mentally manipulate and imagine actual materials in a given way quickly and accurately. This sub-tests consists of two parts - Part I and II

### Sample Item 1

Find out which options- A, B, C and D from the Answer Figure has parts that can make the Problem Figure.

**Problem Figure**

**Answer Figure**

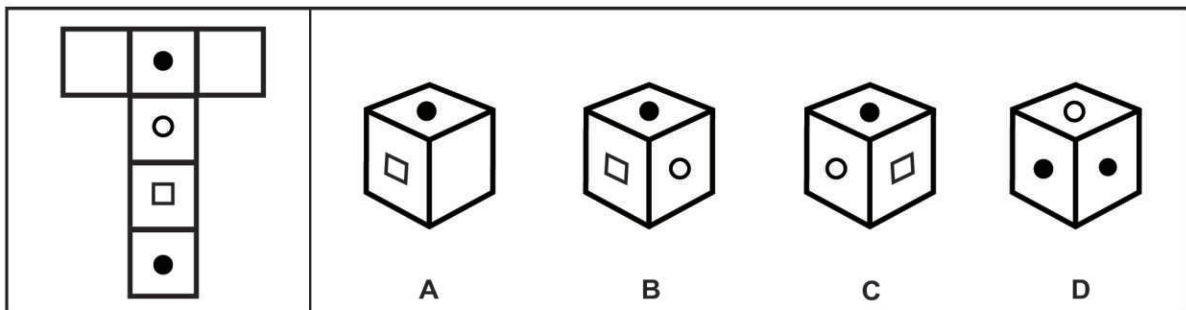


When we arrange the parts given in the Answer Figure, only option "A" correctly forms the Problem Figure. Therefore, option "A" is the right answer.

### Sample Item 2

**Problem Figure**

**Answer Figure**



When the Problem Figure is folded such that the bottom most side (with a dot) is at the top then the side above it (which has a small square on it) will be visible in front and the side (with no pattern on the outside) will be on the right side. Thus option "A" is the right answer.

## VII. Sub-test: Perceptual Aptitude (PA)

**Perceptual Aptitude (PA)** assesses student's ability to quickly, accurately and meaningfully compare visual information which can be in the form of letters, numbers, objects or patterns.

### Sample Item 1

39461084

- A. 39416084
- B. 39461840
- C. 39461084
- D. 39461480

All the combinations given in the options appear similar. However the sequence of numbers is different except in 'C'. Therefore, the right answer is "C".

### Sample Item 2

CEDdGgFE

- A. CEDDGgFE
- B. CEDdGgFE
- C. CEddGgFE
- D. CEDdggFE

All the combinations given in the options appear similar. But, except 'B' they are not exactly the same as the test number. Hence, the correct answer is 'B'.

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Central Board of Secondary Education, New Delhi

and



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