

### Test and characteristics of a good test

**Objectives:** At the end of this lesson you shall be able to

- state the purpose and characteristics of tests
- list and explain various types of testing methods
- list the three levels of complexity of test items and their key words
- state the criteria for objective type test items with examples
- state the characteristic of good test.

Teaching and learning is completed by conducting tests to measure the learners achievements at every stage of the education.

#### Test

'Test' is defined as an unaided performance by the learner.

It is a tool (or) yardstick to measure the learners achievements and the teacher's success.

It can also be defined as a tool (with set of questions) used to measure /assess the skills and knowledge of the learners, what they have learned or have been taught.

#### Purpose

- To provide basis for selection of candidate e.g., entrance test.
- To provide an incentive for promoting learners activity in a training situation.
- To check the understanding of the learners.
- To know how far the teacher has been successful in teaching.
- To classify or grade the learners.
- To encourage and motivate the learners to study.
- To revise the topics and to keep the knowledge fresh and upto date.
- To create feeling of competition.
- To guide the learners by knowing their weak points.
- To decide the aptitude of the learners.
- To help the parents to know the performance of their wards.
- To help the administration to record the performance of teachers and students.
- To get success or failure of a particular training programme.
- To help the learners to know their position rank into the class.

#### Testing methods

The testing methods are broadly classified in two according to their nature and function, they are:

- a Formative (Non - Standardised test)
- b Summative (Standardised)

##### • Non - Standardized tests (Formative)

These are conducted by the instructor themselves and will be based on syllabus covered by them (ex. Weekly, monthly test unit). There is a possibility that they may design the question paper according to the standard and level of the students. Hence these tests are not considered reliable and certificates will not be issued.

##### • Standardized tests (Summative)

These are conducted by a recognized examining body like university, national council, board of exam, etc. The question paper will be set by the examining body and will be based on the common syllabus. This type of tests will be normally conducted at the end of the course. And the certificate will be issued to the successful candidates. These certificates will be accepted for employment .

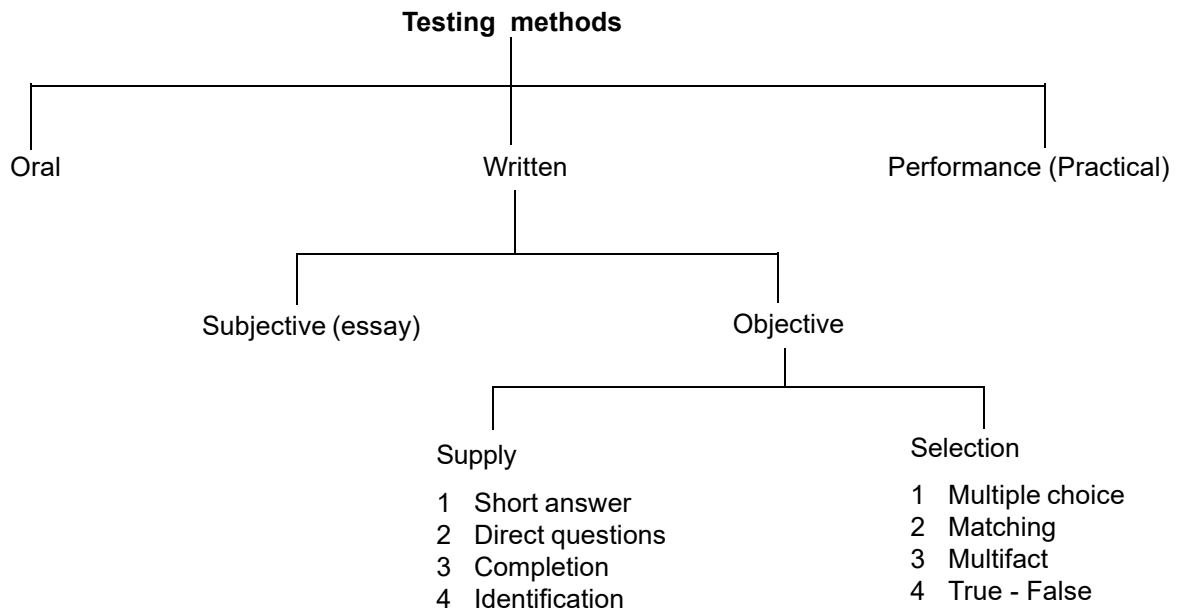
Both standard and non-standard testing methods are further classified as below:

##### • Oral Test

Oral tests are simple series of questions asked to the trainees/ students verbally and are answered verbally.

**Example : "Interview" test:** various types of oral test depends upon their timings/duration, i.e before, (or) after the completion of course. Examiner must be well versed in questioning technique .

For effective use, this test should be taken as supplementary test along with written (or) practical test, which is not considered as a deciding factor.



### Written tests

These tests are more effective than oral. The questions and answers are both in written form. Question can be spread over the entire syllabus which gives uniform assessment.

- It needs elaborate preparation and more time.
- It may affect the performance
- Permanent record of the tests can be maintained

### Written tests are of two types.

- Subjective (essay)
- Objective
- **Subjective (essay) type**

It is also known as 'Essay type' the questions are few and short. But the answers are lengthy.

Setting of question papers is easy, but checking takes more time.

Performance and expression of the trainee is affected by personal views and ideas of instructor / teacher.

Essay type tests are especially useful to test the quality of knowledge. It is useful to test the personality traits of an individual.

It cannot pin-point the exactness of knowledge, So trainees try to hide their ignorance under the cover of words.

It is useful to test theoretical knowledge only.

To avoid the possibility of copying students can give lengthy answer in his own words.

Questions are asked generally with introductory words like:

Define, Explain, Compare, State, Describe, Discuss, Distinguish, Why what, which etc.

### Objective type test

Objective type test is conducted largely, and is in common use, because time can be saved and it offers high reliability.

If they are not properly constructed, they may be more unreliable.

### Types of objective test

**This tests are divided in two major categories**

- Supply type items
- Selection type items

### a Supply type

In this type, students/trainees are required to supply the answer to short answer questions, (or) fill in the blanks in one or two words.

#### • Short answer type

This test satisfies to some degree to the objectives of both the objectives and essay type examination by this. They can be given the opportunities.

The rate of answering depends on individual ability to think and write quickly.

#### • Direct question type test

It will be in the form of a direct question. The trainee responds by providing correct answers by word or by sentences (or) by symbol.

### • Completion type

The completion tests consists of a statement from which some essential word has been omitted. It is also called as fill up the blank test.

### Identification type

In the vocational training identification of tools is a very important factor. It can be done on the shop floor by directly explaining by giving various tools for different kinds of work and the items by writing the letters or numbers marked for each item.

### b Selection type test

These tests are either in the form of direct questions (or) incomplete statements. This tests, is further divided as:

#### • Multiple choice test

In the multiple choice type, the trainees / learner is required to select the correct (or) the best response/ answer (key) from four options (one key with 3 distractors). Now, this test item is only used in All India Trade Test.

Example : What is the SI unit of work done?

- A Kg/meter
- B Joule
- C Newton meter
- D Kg-meter

The criteria's of multiple choice and other details will be explained later.

#### • Matching type

This type of test consists of two sets of items in parallel columns which are to be matched. One column is called **premises** and other column is called **responses** (response column must have more than one number of items in the premises) (ie) 3: 4 (or) 4 : 5.

The trainees /students are required to match 3 premises to 4 responses, so that for any one premises must match with 2 responses.

### Examples

Match the responses to corresponding premises.

Match the units to the corresponding terms / quantities

Column A		Column B
1 Work	A	Newton
2 Power	B	Joule
3 Energy	C	Kg-m/Sec.
4 Force		

### Key

1       2       3       4

#### • Multiple facet type

This test item is also referred to a number of multiple choice which is given one below the other relating to various aspects at the same theme presented as a material.

#### • True - False type

This test consists of a series of statements which are to be marked as either right or wrong (True or False)

It is one of the easiest test to make and it is largely and widely used. But it is unreliable, so, some students are unable to secure marks/ score as they are same in others.

1 HP (metric) unit is equal to 746 Watt.

(True (or) false)      T / F

#### Performance test (Practical test)

Performance test is another name of practical test that measures the level of skill attainment which are to be evaluated so, the jobs (or) exercises should be designed to make the students apply his knowledge and demonstrate his skill.

### Level of complexity of test item

**Difficulty and complexity** are important factors that occur in every test questions.

These two factors will also affect the reliability of the test. Hence difficulty and complexity must be considered by educator during preparation of the test questions.

### Complexity

It is defined, as the levels in Bloom's Taxonomy.

**Difficulty:** It is represented by preparation of the students who scores with internals.

Difficulty is based upon the amount of effort needed to answer a question, solve problem (or) complete a task.

Such question (or) task are defined as easy or hard and determined by how many people can answer this question successfully.

**Complexity** relates to the level of thinking, action and knowledge need, in order to answer a questions, solve a problem (or) complete a task and how many different range. It leads after challenge and engage students to demonstrate of the higher levels of Bloom's taxonomy.

### 3 Levels of complexity of questions

There are 3 levels of test which are followed for preparing questions for All India Trades test to ITI trainees.

They are:

**Level I** - Facts Knowledge / Recall memory

**Level II** - Functional understanding /principle transfer knowledge

**Level III** - Problem solving

#### Level - I Fact knowledge/ Recall memory

It is limited with fact of knowledge, which skilled worker need to understand about isolated fact of names and construction of the equipment /tool/instruments and with supporting factors (formula, specification etc.) This can be learned without acquiring any understanding.

**Action verbs** : Parts- names, types - definitions - standards, symbols - units- specifications - materials - formula, ranges - etc.

#### Example -1

- What is the unit of current?

- A** Ohm
- B** Ampere
- C** Volt
- D** Watt

Key : **B**

#### Level - II

Principles and transfer knowledge (thinking and reasoning ability)

It is the limit with knowledge of a skilled worker who needs to know how to do his job in a professional way. Here transferring fact knowledge is more important to apply for doing the job. It covers functional understanding of equipment and processes in the proper working conditions, Comparisons between concepts and rules are their interlinkages which are addressed in this level.

#### Action verbs

Comparison- differences - advantages- disadvantages - operation methods- functions - calculations - uses - relation - purposes - processes - procedures - application selections - benefits - sequence settings - necessities - merits - demerits -preparation- techniques - results - rules.

#### Example

- Which type of single phase motor is used in ceiling fan?

- A** Capacitor start induction run motor
- B** Capacitor start capacitor run motor
- C** Permanent capacitor motor
- D** Repulsion motor

Key : **C**

#### Level - III Problem solving

It is limit with things and processes that went wrong (or) might go wrong. These items deal with defect symptoms and require linkage to causes or to the planning of remedial measures.

#### Action verbs

Problems - defects - remedies - solutions - situations - repairs - failure- analysis - causes- effects- faults- adjustments - preventions.

#### Examples:

##### • Belt drive - defects

In a 'V' belt drive the defect of belt whips excessively caused by pulsating load on the drive.

What arrangement can be provided to eliminate this defect?

Give the brief answer

Key : **Provide fly wheel**

#### Criteria for objective type test items

The following objective type of test items (70%) were followed for All India Trade test (AITT) along with descriptive type (30%) till 2012.

#### Objective type test items

- Short answer
- Multiple choice
- Matching type

Presently multiple choice test item are followed for AITT, with 3 levels of question.

#### Short answer types

Short answer test items are supply items in which the candidates are expected to supply the answer. The short question is designed /framed in such a way that it must have only one specific answer.

**Wide scope** essay type questions can be narrow down into number of short answer questions, which must have only one specific answer (NOT more than 5 words).

## Structure of short answer type

If consists of

- Stem / situation - (description)
- Question
- Illustration to support the situation (If required)
- Direction (ie) give brief answer

**Answer :**

- 
- 

**Key : (With instructors guide)**

**Example: 1**

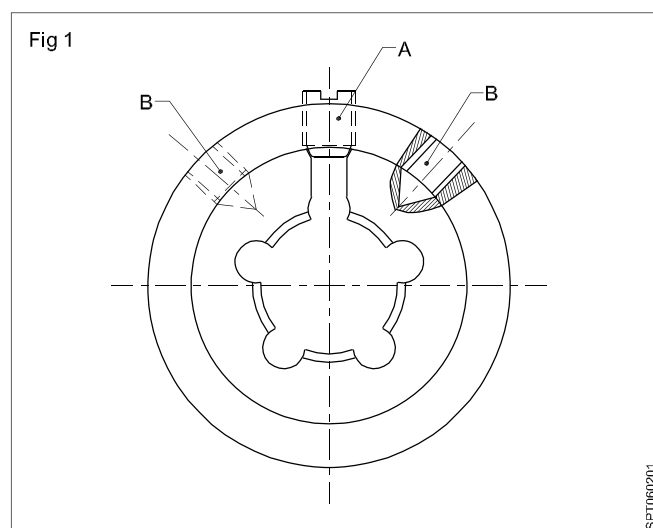
### External thread cutting by die

The figure below is of a split die held in the - stock

What is the name of the screws A?

Give a brief answer

**Key : Grubscrew**



### Criteria for short answer

- Question should be precise and understandable.
- If should be direct
- If it is in direct high light it indirectly means words with bold or underlined.
- Question should mean to give exact answer
- It should be relevant
- Work related
- No highlighting of some facts and asking remaining facts
- No two objective questions are allowed eg. Increase, decrease
- No true (or) false
- Abbreviation and symbols must be as per BIS

- The question should not be asked to give more than one answer
- Key answer should not be more than five words.

## 2 Matching answer type

It is also a selection type item. It can be considered in another variation of multiple choice test item.

Matching test item question is considered much easier than the multiple choice item, because there are in distractive answer.

In this type one has to select the correct answer from the alternatives/ choices provided.

It is very useful to test homogeneous element with simple relationship.

### Structure

- Direction and instruction
- Matching item consist of a series of items which are called as

### “Premises (or) statements”

- Series of alternative answer are called as “**responses (or) options**”
- The premises should be larger than responses.

### Examples

#### Level - 3

#### External thread cutting by die

Match the causes with the defects given below while forming the external thread with split die and die stock.

#### Causes

- Die is blunt
- More force without reverse
- Die holding screw not properly tightened
- Split screw is not correctly tightened

#### Defects

- Die slip
- Hard to rotate
- Die get heated

#### Key

- 1 **B**      2 **C**      3 **A**      4 **B**

### Criteria for matching answers

- Description / stem is not compulsory unless if it is necessary.
- Matching condition should be compulsory and should be clear (what to be matched with what).
- Premises and responses should have clear heading.
- Premises should always be named with numerical and responses with alphabets.

- Longer sentences should always be under premises and shorter sentences should be under response.
- Responses should be one number less when compared with premises.
- Illustration (graphics) should always be under responses.
- Out of all responses one response should be matched correctly with two premises.
- Numerical symbol and standard formula should be under responses.
- Number of option should be minimum 3 (or) 4 (ie) 3:4 (or) 4:5
- Work related content only should only be asked.

### Multiple choice test item

This type is only used for All India Trade Test, presently it is a selection type question. This is a very popular objective type test. In this type, a statement is given and to complete it meaningfully, 4 alternatives are given (one is key, other 3 are distractor).

The student has to select the best answer to complete the statement. Normally the response is given by writing letter of the chosen statement in front of the number of the statement.

### Structure of multiple choice

- It consists a statement (or) situation description which is called as STEM (if required)
- And then question is present which is followed by number of choices, also called as "Alternative" (or) Option's
- The selected answer is known as "KEY" and the remaining ones are called "Distractors"
- Below this, direction is given as "Choose the correct (or) best answer"

### Structure of Multiple Choice

STEM - Consists of information and question

Answer field consists of

- 3 alternatives and one key
- Direction - Choose the correct answer (or) choose the best answer

### Answer field

A B C D

### Key

A B C D

### Example

- 1 Holding device for drilling in round bar

Choose the best device to hold and locate a round bar for drilling.

- A Adjustable locator
- B 'V' block
- C Pins locator
- D Wedge type location

Choose the correct answer

**Key : B**

### Criteria of multiple choice item

- Among the four choice, three should be distractive answers and one should be the correct answer and these three distractive answers should be close to the correct answer.
- Distractive answers and correct answer are to be named as A, B, C, D only
- Distractive answers should have close relevance otherwise, it is easy to differentiate the correct answer.
- Distractive answers should be in short form and not more than maximum six words.
- If distractive answers are sentences, they should be arranged in a uniform way either bigger to smaller (or) smaller to bigger.
- If distracter are numeric value, they should be arranged in a uniform way either highest to smallest (or) smallest to highest.
- Key should not be different in content (or) wording.
- All the above, none of the above, should be avoided.
- No clues in wording like always/never etc.,
- Both (A & B) or (C & D) to be avoided.
- If the stem is in the form of the question, it should be with the question mark symbol and the alternatives should always start with a capital letter.
- If the stems is in the form of an incomplete sentence, the choice must be ended with a period and the stem should not have any punctuation mark.
- If it is an incomplete sentence, the first word in each alternative should start with a small letter, and each choice should end with a period. (Except : Noun)

**The table shows all 3 types of test items format for easy reference**



**Short answer items**

**Stem:**  
**Situation question**

**Illustration**

**Answer field**  
a \_\_\_\_\_  
b \_\_\_\_\_

**Matching items**

**Direction: Matching  
condition of content**

**Heading: Premises**

1  
2  
3 **Premises**  
4

**Heading: Options**

A  
B **Options**  
C

**Multiple choice items**

**Stem:**  
**Situation question**

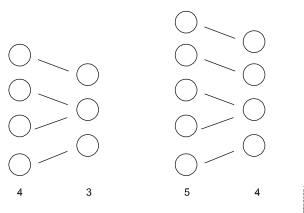
**Illustration**

**Answer field**  
A  
B  
C **Answer field**  
D

**Matching Conditions**

**Only once or more than once**

**Maximum two  
answers are  
possible**



**3 distractors and  
one answer correct  
or best**

**Characteristics of a good test**

A good test must have the following characteristics

**Validity**

The test must be based on the subject matter taught in the course, and valid for a particular situation

**Reliability**

The test should be able to accurately measure the graspness of the learners to their standards and the test is set for the consistency.

**Objectivity**

The test should be designed to keep out personal opinions of examiners. If the answer papers are checked by different examiners the results should not vary more than 5 to 10%.

**Discriminative**

The test results should clearly indicate the best and worst among students. It helps the teacher to classify the students in the class.

**Comprehensive**

The test paper should be spread over the entire syllabus. This enables the teacher to know which topics can be understood well and are not.

**Ease of marking**

The test should be reasonably direct or simple and easy to mark.

**Definite**

The questions should be in such a way that there should be only one correct answer.

**Visibility**

The test should be easy to administer (manage) and easy to check.

**The following Points to be considered for a good test**

- Statement or problems used in questions must be clear and has a definite meaning.
- Test questions should be prepared to measure the application ability of facts, principle rather than to memorize and recall.
- Test should be valid and reliable at different times and under different situations.
- Test must be easy to use, easy to administer and require minimum time to answer
- Before including a question in a paper, you must answer the same yourself, within the time limit set. If you can not answer, do not include them.
- The correct answer to any question should not be in the form of another question.
- Equal time must be given to all questions having same score.
- Several number of good tests can be conducted to have more practice for answering.
- It should be relevant to test and suitable for final trade test.
- Use maximum illustration and it should be clear.
- No highlighting of specific facts and asking for some other factor.
- Abbreviation and symbols must be as per BIS.
- Avoid using words such as mostly, frequently, easy, different etc. In question form.
- The ever changing non-standard information should not be asked.
- Key should not be different in content (or) wording.
- If the stem is in the form of question, It should be with the question mark symbol and the alternatives should always start with capital letter.