

Item Writing Training Manual DSI (Certification Psychometrics)

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Introduction

Purpose of the Manual

The purpose of this manual is to provide supplemental information that supports the item writing training conducted by PSI Cert Psych. The contents within this manual are intended for the creation of multiple-choice items suitable for credentialing exams.

By following the instructions in this manual, item writers of professional associations will increase their proficiency in writing effective items for credentialing examinations. The item examples used in the following instructional sections make use of general knowledge in order to facilitate understanding of the general principles offered throughout this manual. The skills needed for writing quality items are similar across content disciplines.

Overview of Item Writing

The cornerstone of any credentialing examination is the individual item. Tasks and knowledge required for work or practice should be identified on the basis of a job analysis and are the justification for the content outline used for the examination. All items should be linked directly to the exam content outline.

The multiple-choice item is most frequently used and appropriate for all types of examinations (e.g., credentialing, training assessment, employment, classroom-based, and college entrance). The most commonly used type of test item in certification and licensure (credentialing) examinations is the conventional multiple-choice item with one correct response and three incorrect responses. Although many other alternative item formats exist (e.g., multiple choice multiple response, true-false, 3-option multiple choice, discrete option multiple choice, hot spot, drag-and-drop), their use may not be appropriate for all testing programs.

This guide is designed to familiarize item writers with the overall process and the best practices of writing a multiple-choice item that can be used for examinations developed by PSI Services (PSI). It is not a comprehensive discussion of examination development.

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Anatomy of a Multiple-Choice Item

Item Anatomy

The single-response multiple-choice item type consists of a stem, followed by a series of possible answers or completions, called options. An understanding of the following key terms is important to establish uniformity:

- Item An item is a single scorable element of an exam and it encompasses all of the text presented to examinees. In multiple-choice testing, it is customary to speak of test items rather than questions, because items may be presented in formats other than a question and the emphasis is on scoring.
- Stem The stem is the portion of an item that issues a prompt usually in the form of a question, but addition information such as tables or graphics may also be included. The stem of the item should clearly present the central problem or idea.
- **Options** Options are the possible responses to the stem. Options are further delineated as distractors, which are the incorrect response, and the key, which is the one correct response.



Formats for Stem

The two formats of the stem are as follows. Use whichever format is most clear, concise, and direct.

Question and Response

Which planet is orbited by the Galilean moons?

- A. Jupiter
- B. Mars
- C. Neptune
- D. Saturn

Complete the Sentence

The orbits of the Galilean moons center on

- A. Jupiter.
- B. Mars.
- C. Neptune.
- D. Saturn.



Characteristics of Well-Constructed Items

An item should:

- be categorized to a section of the Exam Content Outline.
- assess something that is relevant and important to the job.
- describe realistic and practical situations.
- not use language verbatim from a reference.
- include the most current information available.
- avoid jargon and overly conversational language.
- describe individuals in an objective manner.
- avoid terms that may perpetuate stereotypes.
- avoid pronouns and instead use a title or description.
- include word and phrases that are universally-understood.
- include technical terms but avoid regional or cultural terms.

The stem should:

- solicit a single response.
- contain all necessary information to answer the question.
- be concise.
- not be negatively-worded.
- not include a clue word that makes the key obvious.

The options should:

- answer what is asked in the stem.
- conform grammatically to the stem.
- be realistic and genuine concepts or terms.
- avoid repeating or overlapping content across options.
- be consistent with other options in terms of length and detail.
- not contain "all of the above" or "none of the above".
- exclude qualifying words or extraneous details.

The key should:

- be the only correct answer.
- not be subject to opinion.
- be supported by an authoritative reference.
- represent what is correct in actual practice.

The distractors should:

- be defensibly incorrect.
- not be partially correct.
- not be incredibly obvious.
- be plausible to those who don't know the correct answer.
- reflect misconceptions and errors.



Cognitive Level

Identifying the cognitive level of an item will require consideration of the type of thinking required of a typical examinee responding to the item.

PSI uses either a two-level or three-level classification system to identify the level of thinking required to respond to an item. The models used are based on Bloom's taxonomy¹.

- The two-level system includes: Recall and Application.
- The three-level system includes Recall and further subdivides Application-level items into: Application and Analysis.

The two-level system is typically preferred because the distinctions among levels 2 and 3 are often too granular for accurate and consistent classification. Further, the primary goal in classifying items to cognitive levels is to minimize or control the number of items classified to the first level such that the exam content is not overly rudimentary.

Level 1 – Recall

Recall items primarily test the recognition or recall of information. Such items require predominantly an effort of memory. They include the recall of specific facts, concepts, principles, processes, procedures, or theories. To simplify, such an item will ordinarily be asking: "What is X?"

Example:

What is the most populous city in the United States?

- A. Los Angeles
- B. Chicago
- C. Houston
- D. New York

¹ Bloom, B. S.; Engelhart, M. D.; Furst, E. J.; Hill, W. H.; Krathwohl, D. R. (1956). Taxonomy of educational objectives: The classification of educational goals. Handbook I: Cognitive domain. New York: David McKay Company.



Level 2 – Application

Application items primarily test the interpretation or evaluation of information. These items require the application of known or presented information to solve or address situations, problems, and scenarios. Items could require examinees to make judgments concerning the effectiveness, appropriateness, or best course of action for a particular situation. Items at this level will ordinarily be asking: "Given the following information about Y, what is X?"

Example:

Which diagnosis is most appropriate for a 28-year-old individual who exhibits anhedonia, difficulty making decisions, and a recent change in sleeping habits?

- A. Generalized Anxiety Disorder
- B. Major Depressive Disorder
- C. Dissociative Identity Disorder
- D. Brief Psychotic Disorder

Level 3 - Analysis

Analysis items primarily test the ability to analyze information. As with application items, these items require the application of known or presented information but with an emphasis on the interrelationships of multiple sources of data. Items at this level will ordinarily be asking: "Given the following information about Y and what is already known about Z, what is X?"

Example:

Which color in the spectrum of visible light appears most similar to ionizing radiation when shown on a spectroscope?

- A. Blue
- B. Red
- C. Violet
- D. Yellow



The Item Writing Process







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Two Error	A. Vital signs and weight (KEY) B. Vital signs and activity level C. Vital signs and radiographs D. Vital signs and appetite level Repeated Phrase In Options
Corrected	 Which data must a nurse collect as part of a patient record? A. Weight (KEY) B. Activity level C. Radiographs D. Appetite level
Two Errors	One way to determine a patient's heart rate is to listen with a stethoscope. What is another method that you could use? A. Computerized tomography B. Air displacement plethysmography C. Positron emission tomography D. Sonography (KEY)
Corrected	 Which is an appropriate method to determine a patient's heart rate? A. Computerized tomography B. Air displacement plethysmography C. Positron emission tomography D. Sonography (KEY)
	Ambiguous Term
Two Errors	 What is the acceptable amount of distance between exercise machines? A. Under 5 feet B. Between 2 and 4 feet (KEY) C. Between 3 and 5 feet D. Over 1 foot
orrected	 What is the minimum amount of distance required between exercise machines? A. 1 foot B. 2 feet (KEY) C. 4 feet

A nurse needs to collect information for a patient record. What data must the nurse collect as

part of a patient record?

D. 5 feet