

American Institute of Constructors

Constructor Certification Commission Document No. 18

Examination Item Writing Instructions and Form

The purpose of this document is to serve as a guide in writing examination questions for the Level I – Construction Fundamentals (CAC) and Level II – Construction Applications (CPC) certification examinations. All examination questions should be written to adhere to Bloom’s Taxonomy levels of **Understanding and Analyzing**, definitions for which are included in this document.

Item Writing Guidance:

Creating strong assessment items is both an art and a science. Every multiple-choice item must include a correct answer and highly plausible, but incorrect, distracting answers. Much information can be gained from how examinees respond both correctly and incorrectly when items are of the highest quality.

On these exams, we are not measuring an examinee’s ability to read. We are assessing the ability to do a job. Keep that in mind. Writing items in such a way that superfluous wording and/or jargon is introduced is not only unfair to the examinee, but creates validity questions about the exam. Similarly, avoid topics that could distract an examinee from answering the question posed. That is, avoid topics that are biased against or for a particular group of individuals.

Below is a table of common do’s and don’ts in writing strong items. Be sure to use this list to confirm that items you create are following these guidelines.

| DO | DON'T |
|--|---|
| include one correct response (aka, the key) | use jargon or tricky wording or uncommon acronyms |
| include 3 wrong, yet plausible, distractors: e.g., common errors, true statements that do not address the stem, familiar key words/terms, logical misconceptions | reference topics superfluously or intentionally create difficult reading |
| include source materials for the key | clue to the right answer in the stem (question) |
| include calculations for all options, should the item require mathematics | include opinion or humor |
| write in clear and concise language | use absolutes (always, none, never) |
| note the assessment expectation you are measuring | be overly specific or overly general |
| note the Bloom’s level you are measuring | create negatively worded questions |
| create items independently of one another | create ‘all of the above’ or ‘none of the above’ |
| order responses logically, numerically, or shortest to longest | use ALL CAPS for terms within stem |

References:

| <u>Bloom's Taxonomy</u> | |
|---|---|
| Evaluation | <p>Shown by presenting and defending opinions by making judgements about the information, the validity of ideas, or quality of work based on a set of criteria. Its characteristics include judgement in terms of internal evidence and/or in terms of external criteria.</p> <p><i>Example:</i> Which kinds of apples are suitable for baking a pie, and why?</p> |
| Synthesis (Create) | <p>Shown by building a structure or pattern from diverse elements; it also refers to the act of putting parts together to form a whole or bringing pieces of information together to form a new meaning. Its characteristics include:</p> <ul style="list-style-type: none">• Production of a unique communication• Production of a plan, or proposed set of operations• Derivation of a set of abstract relations <p><i>Example:</i> Convert an "unhealthy" recipe for apple pie to a "healthy" recipe by replacing your choice of ingredients. Argue for the health benefits of using the ingredients you chose versus the original ones.</p> |
| Analysis (Analyze) | <p>Shown by examining and breaking information into component parts, determining how the parts relate to one another, identifying motives or causes, making inferences, and finding evidence to support generalizations. Its characteristics include:</p> <ul style="list-style-type: none">• Analysis of elements• Analysis of relationships• Analysis of organization <p><i>Example:</i> Compare and contrast four ways of serving foods made with apples and examine which ones have the highest health benefits.</p> |
| Application (Apply) | <p>Shown by using acquired knowledge to solve problems in new situations. This involves applying acquired knowledge, facts, techniques and rules. Learners should be able to use prior knowledge to solve problems, identify connections and relationships and how they apply in new situations.</p> <p><i>Example:</i> Would apples prevent scurvy, a disease caused by a deficiency in vitamin C?</p> |
| Comprehension (Understand) | <p>Shown by demonstrating an understanding of facts and ideas by organizing, summarizing, translating, generalizing, giving descriptions, and stating the main ideas.</p> <p><i>Example:</i> Summarize the identifying characteristics of a Golden Delicious apple and a Granny Smith apple.</p> |

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| Knowledge (Recall) | <p>Shown by recognizing or remembering facts, terms, basic concepts, or answers without necessarily understanding what they mean. Some characteristics may include:</p> <ul style="list-style-type: none"> • Knowledge of specifics—terminology, specific facts • Knowledge of ways and means of dealing with specifics—conventions, trends and sequences, classifications and categories • Knowledge of the universals and abstractions in a field—principles and generalizations, theories and structures <p><i>Example:</i> Name three common varieties of apple.</p> |
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[ACCE Student Learning Outcomes](#)

6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
8. Analyze methods, materials and equipment used to construct projects.
9. Understand construction management skills as an effective member of a multi-disciplinary team.
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. Understand construction risk management.
14. Understand construction accounting and cost control.
15. Understand construction quality assurance and control.
16. Understand construction project control processes.
17. Understand the legal implications of contract, common and regulatory law to manage a construction project.
18. Understand the basic principles of sustainable construction.
19. Understand the basic principles of structural behavior.
20. Understand the basic principles of mechanical, electrical and plumbing systems.

Procedure:

The item writing process to be followed for each examination question written is as follows:

- 1) Refer to the appropriate (CAC or CPC) Examination Specifications (Commission Document 29)
- 2) Select the Domain (major specification category) and Sub-Specification (sub-category) consistent with the subject of the proposed question and enter this information in the provided spaces
- 3) Provide citation to the Material or Reference Source(s) that provides documented evidence of the correct answer to the question
- 4) Write the first part of the multiple-choice question or stem in the appropriate space followed by entering the correct answer and three other plausible answers.
- 5) Circle the number next to the correct answer.
- 6) Provide the completed item writing form to either the Examination Committee or Commission Certification Manager for further processing.

| | | |
|-------------|--------------------|---------------------|
| Author: | | Date: |
| Circle One: | Level I – CAC Exam | Level II – CPC Exam |

| | |
|---|--|
| Every item must measure exactly one sub-specification within the domain. Refer to the CAC or CPC exam specifications, as appropriate. | |
| Domain | |
| Sub-Specification | |

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| Source Materials: | |
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| If Level I – CAC Exam is selected above, circle the Bloom’s level and ACCE Student Learning Outcome (SLO) associated with this question. | |
| Bloom’s: | Analyze Understand Knowledge |
| SLO: | 6 7 8 9 12 13 14 15 16 17 18 19 20 |

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| Stem: | |
| | |

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| Circle correct answer | <p>You must provide one correct answer and 3 incorrect, but plausible, answers.</p> <p>If calculations are present, show how incorrect calculations were derived.</p> |
| 1. | |
| 2. | |
| 3. | |
| 4. | |

Revision History:
 Last Revision: 09/10/2022