Certification Question
Writing Workshop

Presented by
AACE International Certification Board

Adapted from a presentation at the 2009 Annual Meeting
in Seattle, Washington

web.aacei.org
Introduction
Exam Formats
Question Types & Format
Testing Objectives
What to consider when writing a question
Guidelines for writing test questions
Guidelines for writing answers (alternatives)
Question Review Process
Summary – Question Development
Why write certification examination questions?

– To ensure the certification exam contains a variety of industry related areas or processes
– To ensure the databank remains updated
– To cover the entire body of knowledge
– You can earn recertification CEUs

Note: you must allow at least 120 days for submitted questions to be properly reviewed, vetted and approved.
Certified Cost Technician (CCT)

- 3 hours maximum
- 100 Questions
- Open Book – ONLY two books permitted: AACE’s CCT Primer and AACE’s Skills & Knowledge (downloaded reference books should be printed and bound in a book; no loose paper, iPads, Kindles, etc. will be permitted for resource materials)
- Candidate’s battery operated calculator permitted (not provided by the testing center)

Continuous, simple multiple choice questions
Certified Scheduling Technician (CST)

- 3 hours maximum
- 100 Questions
- Open Book – ONLY two books permitted: AACE’s CST Primer and AACE’s PSP Study Guide (downloaded reference books should be printed and bound in a book; no loose paper, iPads, Kindles, etc. will be permitted for resource materials)
- Candidate’s battery operated calculator permitted (not provided by the testing center)

Continuous, simple multiple choice questions
Certified Cost Professional (CCP)

- 5 hours maximum
- 120 Questions
- Closed Book – onscreen formula sheet(s) will be available for use
- Candidate’s battery operated calculator permitted (not provided by the testing center)

- Continuous, simple multiple choice questions
- Complex, compound/scenario questions
Certified Forensic Claims Consultant (CFCC)

- 5 hours maximum
- 120 Questions, including 4 essays
- Open Book – candidate’s choice of 2 reference books maximum
downloaded reference books should be printed and bound in a book; no loose paper, iPads, Kindles, etc. will be permitted for resource materials)Candidate’s battery operated calculator permitted (not provided by the testing center)

- Continuous, simple multiple choice questions
- Complex, compound/scenario questions
- Essay writing assignment where the candidate will choose from an onscreen list of suggested scenarios and will write a response in an onscreen text box for the selected scenario
Certified Estimating Professional (CEP)
Decision & Risk Management Professional (DRMP)

- 5 hours maximum
- 120 Questions, including one memo
- Closed Book
- Candidate’s battery operated calculator permitted (not provided by the testing center)

- Continuous, simple multiple choice questions
- Complex, compound/scenario questions
- Memo writing assignment where the candidate will choose from an onscreen list of suggested scenarios and will write a response in an onscreen text box for the selected scenario
Earned Value Professional (EVP)
Planning & Scheduling Professional (PSP)

- 5 hours maximum
- 120 Questions, including one memo
- Closed Book
- Candidate’s battery operated calculator permitted (not provided by the testing center)

- Continuous, simple multiple choice questions
- Complex, compound/scenario questions
- Memo writing assignment where the candidate will write a response to a randomized, given scenario in an onscreen text box
Question Types

- Simple Multiple Choice
- Complex, compound/scenario (multiple choice)
- Written Communication
Consists of three parts:

– The stem (body of the question)
– The correct answer (the key of the question)
– Three incorrect answers, also known as distractors
Consists of four parts:

- The scenario - the basis for all related MCQ (at least 5)
- The stem (body of the question)
- The correct answer (the key of the question)
- Three incorrect answers, also known as distractors
Consists of:

- one scenario outlining a problem or issue
- requiring a written communication response or report
In-Complete Sentence
Direct Question
Embedded Blank
In-Basket
Example:

The three types of value are:

A. Use, Esteem and Internal
B. Use, Esteem and Exchange
C. Esteem, Exchange and Internal
D. Use, Exchange and Internal
Example:

What are the three types of value?

A. Use, Esteem and Internal
B. Use, Esteem and Exchange
C. Esteem, Exchange and Internal
D. Use, Exchange and Internal
Example:

Use, esteem and _______ are the three types of value.

A. Exchange
B. Internal
C. Basic
D. Security
Example:

Include several pieces of information that must be used together to answer questions. Materials might include:

A. Schedules and calendars
B. Policies to be followed
C. Memos
D. Reports
**MCQ – Advantages & Disadvantages**

**Advantages**
- Scoring
- Broader Sampling
- Administration

**Disadvantages**
- Guessing
- Higher-order skills
- Difficult to write
Two components:

- Content: What should be tested?
- Process: How should these topics be tested?
Content: What should be tested?

- Body of knowledge
Process: How should these topics be tested?

- Knowledge: Recalls facts and information
  (words to use: define, list, state, identify, label, name)
- Comprehension: Demonstrates understanding of facts and terminology
  (words to use: explain, predict, interpret, summarize)
Process: How should these topics be tested?

- Application: Can use information in concrete situations
  *(words to use: apply, solve, show, make use of, modify)*

- Analysis: Can break material down into its parts, identifying both the parts and their relationships to each other
  *(words to use: differentiate, compare/contrast, distinguish)*
Synthesis: Can put the parts together to produce a unique entity, generate a plan, or derive new relationships. *(words to use: design, construct, develop, formulate)*

Evaluation: Can use evidence and criteria to judge the value of a thing for a given purpose. *(words to use: appraise, evaluate, justify, judge, recommend)*
<table>
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1. Questions should measure important knowledge, not trivia
   – Avoid questions about personal opinions.
   – Avoid the temptation to make the question more difficult by asking people to remember obscure details.
2. The question should be clearly written
   – Use simple, clear language.
   – Use simple sentence structure.
   – Be concise.
3. Make sure the language is familiar to all test takers
   – Avoid slang.
   – Avoid outdated or obsolete wording.
   – Avoid unfamiliar abbreviations.
   – Avoid company or industry specific terms (acronyms)
   – Currency conversion
   – Units of measure or metrics conversion
4. Avoid offensive language
   - Be politically correct
   - Use non-sexist language
   - Vary the ethnic sound of names
   - International applications
1. The question should define one clear, central problem completely
   - The question should be meaningful without referring to the alternatives.
   - It should lead to conceptually similar alternatives.
Bad question example

Test specifications:

A. Indicate how a test will improve learning.
B. Provide a more balanced sampling of content.
C. Arrange the instructional objectives in order of their importance.
D. Specify the method of scoring to be used on a test.
Better question example

What is the main advantage of developing test specifications when preparing a test?

A. It reduces the amount of time required.
B. It improves sampling of content.
C. It makes the construction of the test items easier.
D. It increases the objectivity of the test.
2. Include as much of the wording in the question as possible.
   - Avoid repeating the same material in each of the alternatives.
   - Alternatives should be as short as possible.
   - Decreases the time needed to read the question.
   - May need to rewrite the question or alternatives to do this.
Bad question example

In objective testing, the term objective:

A. **Refers to the method of identifying learning objectives.**
B. **Refers to the method of selecting test content.**
C. **Refers to the method of presenting the problem.**
D. **Refers to the method of scoring the answers.**
Better question example

In objective testing, the term objective refers to the method of:

A. Identifying learning objectives.
B. Selecting test content.
C. Presenting the problem.
D. Scoring the answers.
3. Avoid negative phrasing
   - State the item in positive form, whenever possible.
   - Positively worded questions tend to measure more important objectives than negatively worded questions.
   - Use negative phrasing only when the wrong procedure or the wrong information can result in serious adverse consequences.
   - Emphasize the negative terms with italics.
Formatting negative phrasing:

- Which of the following is not.... ? (Bad)
- Which of the following is false....? (Better)
- All of the following are....except..? (Best)
1. Correct amount of alternatives
   - Four alternatives (one correct and three distractors)
   - Increasing the number of alternatives reduces the effects of guessing
     - With four alternatives, a person has a 25% change of guessing correctly
2. All alternatives should be plausible

- Obviously wrong alternatives can be ruled out immediately, reducing the number of alternatives considered, which increases the likelihood of guessing correctly.

- Examinees who lack the knowledge being tapped should be equally likely to choose each of the alternatives.
3. Avoid using inclusive alternatives

- Examples include: “All of the above,” “None of the above,” or “Both A and C.”
  - Makes questions very easy or difficult
  - Balance the number of times they are used as the correct and incorrect response
  - “None of the above” is not appropriate for best answer tests. Use with correct answer tests (Math)
4. Randomly assign the position of the correct response
   - The correct response should be assigned to each alternative an equal number of times
   - Test takers are most likely to choose B or C
   - For the purposes of test development, assign the correct response to “A” to reduce confusion. The alternatives can be scrambled later
5. Provide a rationale for the best answer
   - Document the source materials (exam reference books)
   - Steps to be followed
   - Mathematical computations
A test facility costs $75,000 and has a life of 5 years. The facility is leased to users on an hourly basis. The operating costs are $30/hour (labor, consumable materials and other operating costs). For this organization, the minimum acceptable rate of return is 15% and the facility is leased for 24 hours/week on average for 50 weeks each year.

What are the total costs per hour?
First, distribute the initial project cost of $75,000 to 5 years with a ROR of 15%:
A=P(A/P, 15%, 5) and A=($75,000)(1/3.352)=$22,375

Where the value of 3.352 can be obtained from a table or can be calculated by:
[((1+0.15)^5-1)/(0.15)(1+0.15)^5]=3.352

Hourly cost is $22,375/(50x24)=$18.65

Hence total cost per hour is: $18.65+$30.00=$48.65
6. Avoid distractors that differ systematically from the answer

<table>
<thead>
<tr>
<th>Distractors</th>
<th>Correct Answer</th>
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<tbody>
<tr>
<td>Short statements</td>
<td>Long statement</td>
</tr>
<tr>
<td>Negative statements</td>
<td>Positive statement</td>
</tr>
<tr>
<td>Unqualified statement</td>
<td>Qualified statement</td>
</tr>
<tr>
<td>Professional jargon</td>
<td>Simple terms</td>
</tr>
<tr>
<td>Laymen’s language</td>
<td>Technical definition</td>
</tr>
<tr>
<td>Incomplete statements</td>
<td>Complete statement</td>
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<tr>
<td>Specific instances</td>
<td>General rule</td>
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</table>
7. Avoid using similar language in the stem and correct answer

- Make sure that questions and alternatives do not give away the answers to other questions
8. Make sure the grammatical construction of the stem and all alternatives are consistent
   - Verb tense
   - Use of articles “a” and “an”
   - Use of plural and singular nouns
After the question has been written, it is important to carefully review it. Often, the questions do not function as planned. When others read the questions, they may interpret the questions in ways you never anticipated.

Remember, it is good to identify flaws in the test questions, but it is even better to suggest solutions to eliminate the problems.
The CEAG is established to ensure the examination process continues to represent the technical practices and educational requirements.

Committee includes member from:
- AACE Education Board
- AACE Technical Board
- AACE Certification Board
1. Review suggested questions developed and submitted by technical committees, the Education Board, and membership at large.

2. Provide recommendations to the Certification Chair for questions to be included in the certification exam. These recommendations are to be consistent with the required skills and knowledge and technical standards and practices.

3. Once agreed by the CEAG, the question is entered into the examination databank.

NOTE: The Certification Board, through its grading process, provides feedback to the CEAG regarding exam administration.
Step 1: Examine what thought processes the situation is intended to measure

- Identify the processes that would be used to answer the question:
  - Knowledge
  - Comprehension
  - Application
  - Analysis
  - Synthesis
  - Evaluation
Step 2: Identify the content that is included in the question.

As examples, answering the question correctly demonstrates understanding or mastery of the following concepts:

- Types of Cost (Present & Future)
- Escalation (How to apply & to what costs)
- Conversion (Monthly & yearly costs to one standard)
- Future value of a present cost
- Future value of an annuity
- Return on investment
Step 3: Set up a Content by Process Matrix – Sample

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NOTE: Questions submitted for recertification CEUs must be submitted at least 4 months prior to expiration. Not all questions are approved for use; recertification CEUs are awarded for approved questions only. *If you are seeking quick CEUs for a current or upcoming recertification application, this activity is not suitable.*
If you are ready to write and submit an exam question to the CEAG, please use the **New Certification Exam Question Submission form** found on our website by clicking [here](http://www.tfaforms.com/394286).

Full address found here: [http://www.tfaforms.com/394286](http://www.tfaforms.com/394286)

Thank you.