



2023 Item Development & Exam Form Assembly Report

The American Board of Surgical Assistants (ABSA)
Surgical Assistant – Certified Certification (SA-C) Exam

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Summary

Item development and form assembly is a careful, multi-step process that begins once the examination purpose has been defined, once a common understanding of the target domain exists, and once content and performance standards have been determined. Then it is possible to write items that measure the content standards. During the design of the examination, specifications are developed that outline the content that is to be assessed, by the examination. Item specifications are an important component of the process, for the item writer. These specifications are the framework used by item writers to create and develop the examination items. Once the examination specifications are developed, the item development process can begin.

Subject Matter Selection

Subject Matter Experts (SMEs) are selected by recruiting a committee of SMEs that have knowledge in the field to oversee the process. The SMEs were recruited for the item development/review panel based on the number of years they have practiced as a Surgical Assistant – Certified (SA-C) and their general understanding of the surgical first assistant professional role and setting. The American Board of Surgical Assistants (ABSA) attempted to recruit SMEs across various regions and demographic profiles to ensure representativeness. Table 1 presents the experienced professionals who served on the panel for this process.

Table 1. Subject Matter Expert (SME) committee members

Name	Credentials	Location	Yrs as SA-C
Aide Paula	MD, SA-C	Northeast	7
Chika Anthony Obimah	MD, SA-C	South	6
Dmytro Bogunov	MD, BS, SA-C	Northeast	6
Dusko Mirjanic	BS, SA-C	Midwest	8
Fahad Anwer	BS, SA-C	Midwest	2
Francis Ezekwueme	MD, SA-C	Northeast	5
Jean Guy Honore	MD, SA-C	South	2
Maria Nela Rivera Miranda	RN/BSN, SA-C, RMA	South	3
Martha Weeks	BSN/RNC	Midwest	< 1
Melanie Ditchey	MSTE CSA SA-C CST	South	30
Neda Yazdani	SA-C	South	8
Paul Weeks	MD, ScD/PhD, SA-C	Midwest	35

Preston Gant	MD, SA-C	South	5
Robert Johnson	ST, SA-C	Northeast	5
Robert McPheron	ST, SA-C	West	6
Ronald Zapata	MD, SA-C	other	2
Salam Abdo	MD, PhD, BSN, RN, SA-C	South	10
Sherral Hudson-Colbert	CST, SA-C	South	2

Item Writing Assignment

Once Subject Matter Experts are properly trained on best practices in item writing and a test specification (blueprint) is developed, exam items can be written. Item writing is one of the most important factors in developing a quality examination and the content coverage of the exam begins to take shape. SMEs are provided sections of the blueprint based on their specialized knowledge and experience in specific domains to write items. Following this step, many item reviews take place where items are approved, changed, and added to the item bank or rejected and removed from the item bank.

ASC met with the SMEs on August 22, 2023, to facilitate the training of SMEs on item writing. The item writing training consisted of the importance of exam development, the structure of an item, various types of items, and how to write a professional, defensible item, according to the test specifications. After the SMEs had written exam items the SMEs met and reviewed each item and placed each item in their respective domain based on the test specification blueprint. The SMEs reviewed each item for the following characteristics:

1. Candidate content importance & clarity
2. The item was written in the positive & correct tense
3. Single-select multiple-choice with only one correct answer & three distractors
4. Answer options to be parallel in length and structure
5. Distractor options to be feasible and realistic
6. Correct response should not contain 'All of the Above' or 'None of the Above'
7. Each item must have an appropriate reference or rationale
8. Questions are written to avoid bias/stereotypes
9. Rating on a scale of 1 (easy) to 5 (hard) based on the SME's expert knowledge in the field, of surgical medicine.

Please refer to Appendix A: ASC Item Writing Guide

Please refer to Appendix B: ASC Item Writing Checklist

Please refer to Appendix C: Original ABSA Test Specifications (blueprint)

Please refer to Appendix D: Updated Final ABSA Test Specifications (blueprint)

Psychometric Edit

Caveon evaluated existing items to ensure they meet psychometric quality standards (standards such as item clarity, plausible distractors, and parallel options). Additionally, items are assessed for cognitive level, language biases, readability, and alignment with exam objectives. Punctuation, grammar, and style are also scrutinized during the review. Any problematic items are flagged for revision.

Technical Review

During the technical review, the items are carefully reviewed by SMEs to check for technical quality of items. Several factors must be taken into consideration.

1. Is the item technically accurate?
 - a. Is the key the correct answer to the stem?
 - b. Are the distractor's incorrect responses?
2. Is the item congruent to the blueprint task and what it is intended to measure?
 - a. Is the item related to the task and does it provide a reasonable measurement?
 - b. Is the item relevant to the first surgical assistant profession?
3. Is the item at the appropriate level of difficulty for the target audience?
 - a. Complexity of stem or stimulus and plausibility of the distractors

During this review, the SMEs updated the blueprint document to better reflect the first surgical assistant domains and how they were categorized, for the examination.

Table 2 represents the domains the subject matter experts used to create items. How many total items in each domain were written and reviewed; how many items were approved and how many items were rejected.

Table 2. Number of Items Written/Reviewed, Approved and Rejected

Domain	Written/Reviewed	Approved	Rejected
Perioperative			
Preoperative	13	8	5
Operative			
General Surgery	52	41	11
Orthopedic Surgery	46	30	16
Plastic/Reconstructive Surgery	33	20	13
Gynecological Surgery	33	24	9
Varied Other Surgical Specialties	26	24	2
Postoperative	8	5	3
General Surgical & Medical Knowledge			
Asepsis	15	9	6
Surgical Anatomy	80	71	9
Terminology	25	20	5
BLS	15	14	1
Surgical Instrumentation & Equipment	45	31	14
General Medical Knowledge	30	27	3
Professional Practice Knowledge			
Patient Safety/Risk Management/Emergency Protocols	15	12	3
Code of Ethics/Scope of Practice	10	9	1
OSHA/HIPAA	5	3	2
Totals	451	348	103

Pass Score Setting

The Angoff procedure is a widely accepted methodology for establishing the performance standard cut score for a test. The procedure relies upon the judgment of subject-matter experts who examine the content of each test item/task and predict the proportion of minimally qualified candidates that will answer the item correctly, or in this case, the proportion that will score at each of the possible score points. The average of the judges' predictions for a test item becomes the predicted difficulty of the test item. The sum of the predicted item difficulty values for each item averaged across the judges and items on a test form is the recommended cut score.

Please refer to Appendix E: ABSA Angoff Standard Setting Report.

Final Edit

The exam is then edited a final time. During the final edit, the items are reviewed by a person with deep knowledge of item writing principles to ensure the measurement quality of the items and that all revisions from the technical review have been made. This edit also checks the consistency of terms and style across the exam.

Form Creation

It is common practice for certification bodies to have multiple forms. Each form will contain anchor items and unique items that are equally weighted. Two forms are necessary for two basic reasons. If a candidate fails an exam, a new form is administered during a retake or a new form is administered during a 'recertification by examination.'

Having multiple forms makes an exam more secure. ABSA form creation consisted of SMEs rating each item in each domain on a scale of 1 (easy) to 5 (hard) based on the SME's expert knowledge in the field, of surgical medicine. SMEs worked on one domain at a time to determine anchor items and weigh each form by importance, difficulty level, and content in each domain. Each form consists of 61 anchor items and 89 unique items. This results in a 41% overlap of anchor items on each form. Item discrimination must be greater than 0.10 to be retained on a form.

Table 3 represents the exam specifications with domain, percentages, and number of items allocated for each domain.

Table 3. Exam Specifications

01 Perioperative	50% total* 75 Questions
01.01 Preoperative	4% 5 questions
01.02 Operative	43%
01.02.1 General Surgery	11% 15 questions
01.02.2 Orthopedic Surgery	8% 13 questions
01.02.3 Plastic/Reconstructive	8% 13 questions
01.02.4 Gynecological	8% 13 questions
01.02.5 Varied Other Surgical Specialties	8% 13 questions
01.03 Postoperative	3% 3 questions
02 General Surgical and Medical Knowledge	39% total* 59 Questions
02.01 Asepsis	3% 4 questions
02.02 Surgical Anatomy	13% 20 questions
02.03 Terminology	6% 9 questions
02.04 BLS	3% 4 questions
02.05 Surgical Instrumentation & Equipment	4% 7 questions
02.06 General Medical Knowledge	10% 15 questions
03 Professional Practice Knowledge	11% total* 16 Questions
03.01 Patient Safety/Risk Management/Emergency Protocols	4% 7 questions
03.02 Code of Ethics/Scope of Practice	4% 6 questions
03.04 OSHA/HIPPA	3% 3 questions

*Percentages are subject to change at any time

Exam Publishing

Once the final edit and form creation has been completed, the forms are ready to be published. Multiple quality assurance checks are completed to make sure each form is performing as it should, and the platform scoring is correct. Once the forms have passed the quality assurance steps the forms can be moved into production and are ready for delivery to candidates.

Psychometric Evaluation

Caveon will perform statistical analyses of exam items. Utilizing classical exam statistics (p-value and the point biserial correlation), exam items are evaluated, and poorly-performing items are identified. Specific statistics will include:

P-value. This statistic indicates when too many or too few candidates are answering items correctly. When either of these two conditions exists, items are not able to contribute to the effectiveness of test scores.

Point Biserial Correlation. The statistics correlate the performance of individual items with the candidate performance on the exam as a whole. Poorly performing items are identified by low correlations with the test score. Such items are not able to discriminate between test takers who have mastered the content and those who have not.

Caveon met with the SMEs three times to review the Item analysis document that includes the item, item responses, P-value, Correlation, Discrimination, Duration, and the original Angoff score. Caveon highlighted any poorly performing items for SMEs to review. SMEs reviewed all poorly performing items on April 3, April 9, and April 30, 2024, and made suggested changes to the items. Suggested item changes that were evaluated and modified were approved by the SMEs on May 14, 2024.

Summary

Validity in item writing is an extremely rigorous process, to develop and validate exam items.

Appendix A: ASC Item Writing Guide

Appendix B: ASC Item Writing Checklist

Appendix C: Original ABSA Test Specifications (blueprint)

Appendix D: Updated Final ABSA Test Specifications (blueprint)

Appendix F: ABSA Angoff Standard Setting Report



2023 ITEM WRITING GUIDE

Prepared by Assessment Systems Corporation (ASC)



Assessments Systems Corporation (ASC) strives to positively impact educational and career opportunities by facilitating the development of fair, valid, and reliable assessments.

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Introduction

What is covered in this guide

Well-written items form the basis of a valid, reliable, and credible certification examination. High-quality items reflect the important skills and practices individuals use in their profession. This overview is presented to introduce item writers to the exam development and item writing process and to provide guidelines for item writers to help them understand the basic components of high-quality items to support them in their item writing efforts. This guide includes the following topics:

- The importance of validity in the test development process
- Components of an item and key terminology
- Item types and formats
- How to begin writing items
- General style guidelines

This guide should be used as a general framework for item writers to follow when creating and reviewing items for a testing program. This guide should be used in conjunction with the respective testing program materials such as test specifications, specific exam scoring rubrics, and other information such as the exam programs style and item format guidelines. This guide is not meant to be all inclusive but presents a gentle introduction to the best processes to follow for item writers to produce the highest quality items.

The Importance of Validity in Test Development

The Test Development Process

Developing an examination is a rigorous process that involves several different steps. At a high level, there are four main processes in the test development cycle: a) defining the examination scope and outlining the contents on the examination, b) writing items to the examination content following standardized procedures, c) obtaining preliminary statistical information on these items to generate forms and setting a cut score, and d) administering the exam, analyzing the data and reporting the final scores to candidates. Figure 1 presents an overview of these the relationship between these high-level processes throughout the test development cycle.

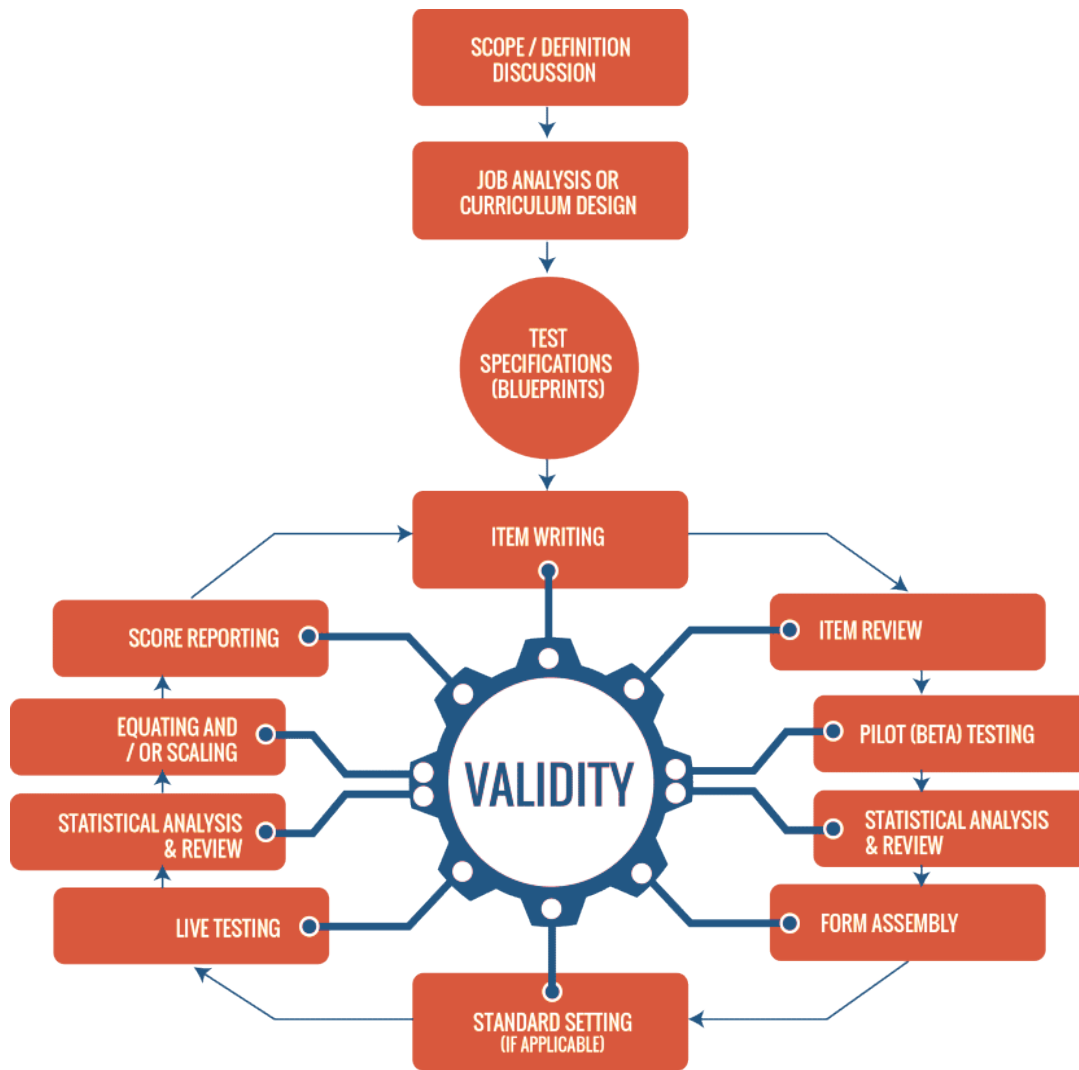


Figure 1. The exam development cycle

Validity

As can be seen from Figure 1, the entire exam development cycle is driven by **validity**—or the degree the examination measures what it claims to measure. Thus, each stage in the development process, from defining the content on the test to reporting scores, adheres to rigorous standards to ensure that the interpretation of the test scores supports the goals of the examination program.



Why Good Item Writing Supports Test Validity

After the initial phase of the exam development cycle which includes defining the exam purpose and defining the content on the examination, items must be written to support the test content.

When writing items, there are several threats to validity that should be recognized. Some of these threats include writing items to test specifications that don't adequately capture the appropriate content, items not written to the test specification contents, items that are confusing, items that are written across multiple content scopes, and items that are systematically biased toward specific groups of test takers.

What is an Item?

Structure of an Item

There are four general components of any multiple-choice item: the stem, the options, the key, and the distractors. Each one of these components plays a specific role and contributes to the overall structure of the item.

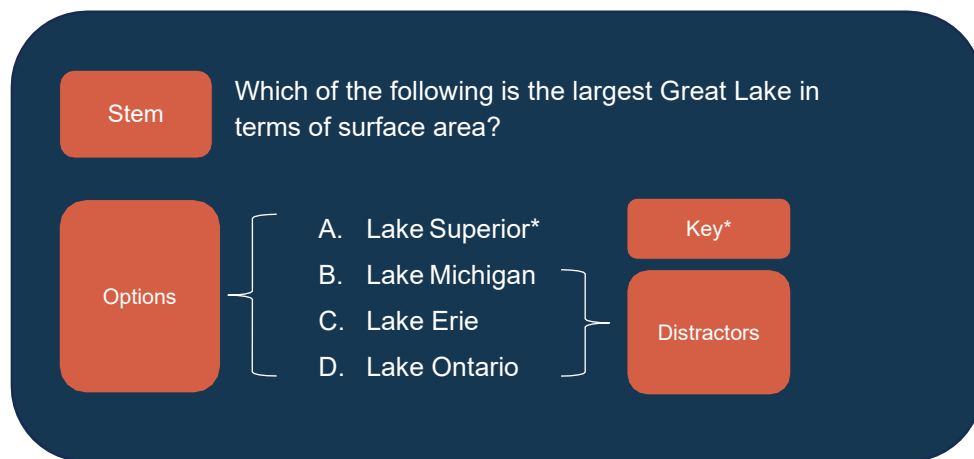


Figure 2. Example single select MC item

Item Stem. The item stem is the question that is being asked. The stem should pose a clearly defined problem, be positively phrased, and include all the relevant information to answer the question.

Item Options. The item options are the answer choices attached to the question that the examinee selects from. The options should all be similar in length and structure, logical, and grammatically correct with respect to the stem.

Key. The item key is the correct answer to the question. The key should clearly answer the question and should not stand out from the other options.

Distractors. The item distractors are the incorrect options to the question. The distractors should be plausible yet incorrect.

Table 1 presents the definitions of key terminology reflective of each component. The general structure of a multiple-choice item is presented in Figure 2.

Table 1. Anatomy of an item

Term	Description
Stem	<p>The stem is the question that is being asked. The item stem should:</p> <ul style="list-style-type: none"> pose a clearly defined problem. be positively phrased (avoid NOT, EXCEPT). include all relevant information to answer the question.
Options	<p>The options are the answer choices to the question (for multiple choice items). The item options should:</p> <ul style="list-style-type: none"> be similar in length and structure. fit logically and grammatically with the stem. not include key words from the stem. not contain specific determiners such as ALWAYS and NEVER.
Key	<p>The key is the correct answer choice to the question. The key should:</p> <ul style="list-style-type: none"> be the only correct answer. clearly answer the question. not include ALL OF THE ABOVE or NONE OF THE ABOVE. not stand out from the incorrect (distractor) options.
Distractors	<p>The distractors are the incorrect answer choices. The distractors:</p> <ul style="list-style-type: none"> should be plausible but incorrect. be based on common errors or misconceptions about the skill or knowledge. be similar in content, terminology, and style as the correct answer (key).

Different Item Types

There are several different types of item types that can be used to formulate items for an exam. Ultimately the type of item used on the test should be decided on given the business objectives, the test design, and the operational structure of the exam. The most common item formats are multiple-choice single select, multiple-choice multiple response, and constructed response items

Single Select Multiple Choice (MC). Single select multiple choice (MC) items are the most common type of test item as they are easier to write than more complex item types and are easily scored in an objective manner, making them highly reliable.

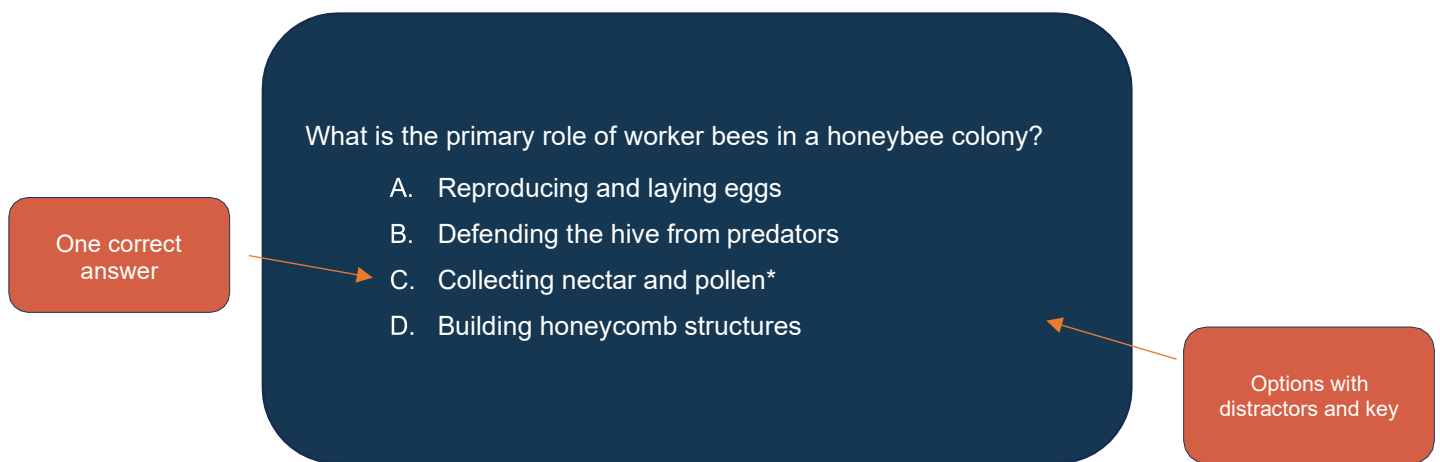


Figure 3. Example single select MC item

Multiple Response Multiple Choice (MCMR). Multiple choice multiple response (MCMR) items are multiple choice items that have more than one correct answer. Multiple response options look like a regular single select multiple choice items; however, there is more than one correct answer key.

When writing MCMR items, item writers should have clearly defined rules on the number of options as well as the number of correct responses (keys). Additionally, MCMR questions should provide the examinee with information about how many options to choose from the list of options.

There are two primary approaches to MCMR items that can be used. The item can include instructions that state "Select all that apply...", or the item instructions can specify a required number of responses (e.g. "Select two of the following..."). The choice of instructions is closely

tied to the scoring model (e.g., weighted options, right/wrong, or partial credit) so the appropriate item writing guidelines are provided to the item writer.

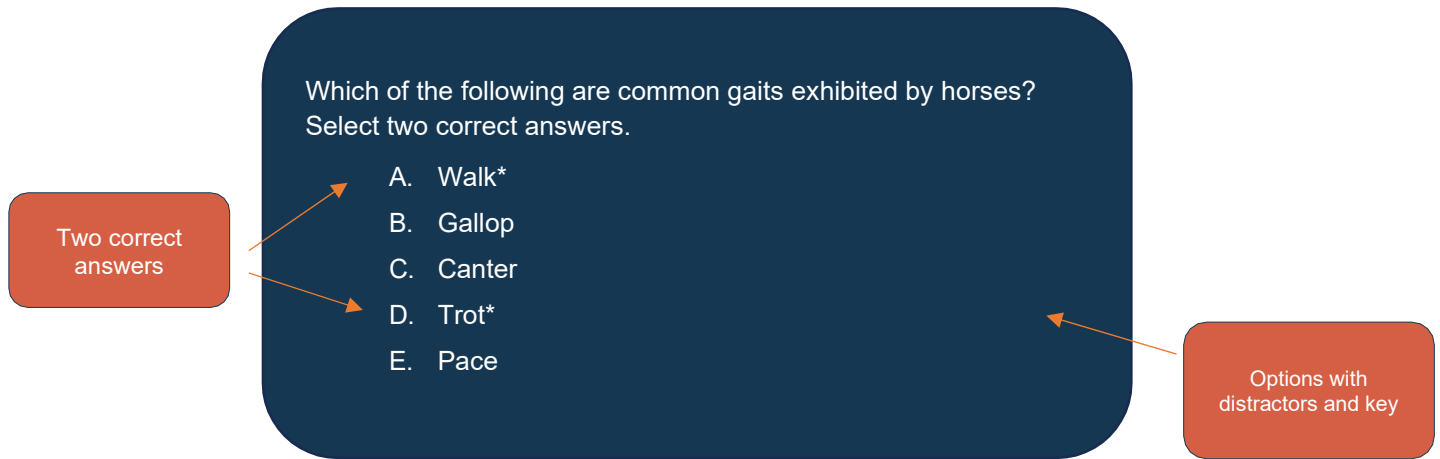


Figure 4. Example single select MC item

Constructed Response. Constructed Response (CR) items are items that require the candidate to produce the answer instead of simply selecting the answer from a list. The required response can be as simple as a single word or can be as complex as the design of a set of procedures to support the lifecycle of a product. Examples of CR questions include asking a candidate to write an essay using a compare and contrast argument and asking a candidate to write down an equation for some type of problem.

Although CR items may be able to tap into skills and knowledge that may not be assessed with a multiple choice type item, special consideration must be given to the scoring and cost of constructed response items at the onset of the test development process to assure that the cost of these types of items adds value to the candidates who take the exam.

Item Formats

Different item writing formats can be used when writing multiple choice items. Each of these item formats are described below with representative examples.

Open Stem Items (Sentence Completion). An open stem item, or sentence completion item, is an incomplete statement where each of the answer options completes the question. In an open stem question, note that the question leads into each option, forming a complete sentence. In an open stem question, the options begin with a lower-case letter and end with a punctuation (or end mark).

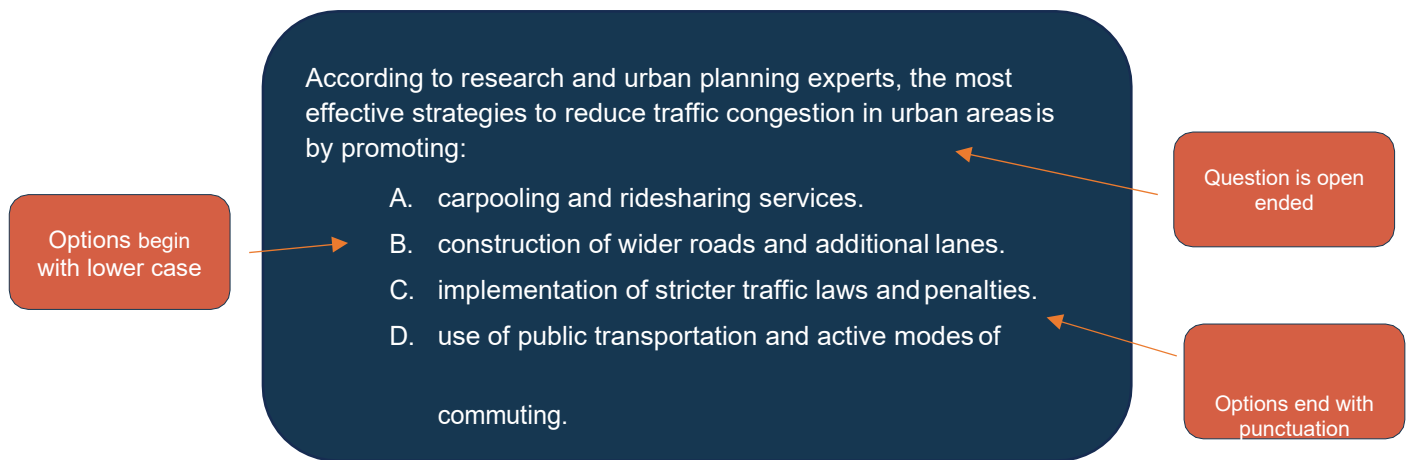


Figure 5. Example open stem item

Closed Stem Items. A closed stem item asks a complete question and ends with a question mark. In a closed stem question, note the question stem ends with a question mark. No punctuation is needed in the option choices, and they should begin with capital letters as they are stand-alone statements unless the answer choices are in fact, sentences. If the latter is the case, they should end in punctuation.

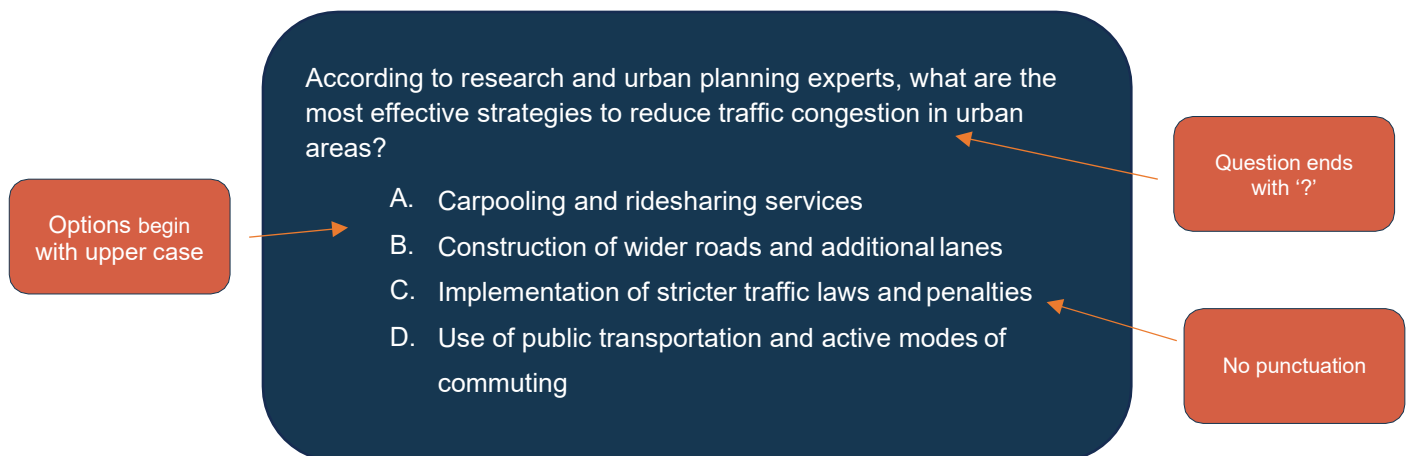


Figure 6. Example closed stem item

Best/Most Item Format. The Best/Most item format requires an examinee to evaluate and select the best, or most appropriate response. The information the examinee is required to use to facilitate the evaluation of the correct answer should all be included in the stem. The information supporting the correct answer should be objective and supported by a consensus in the respective field.

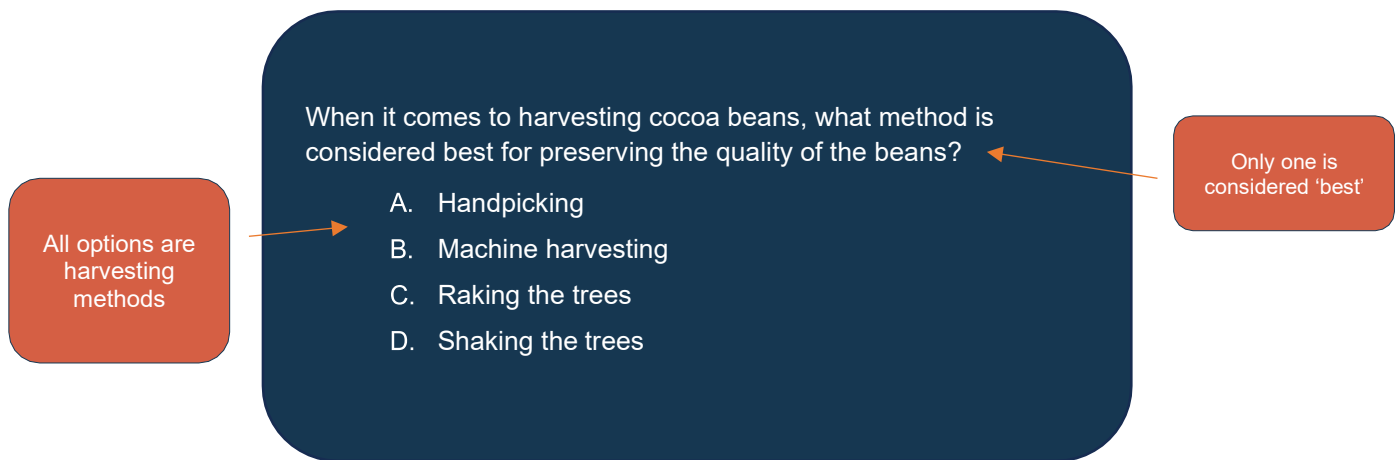


Figure 7. Example Best/Most item

Vignettes with Individual Items or Sets of Items. Items can be developed using vignettes. A vignette is a presentation of a realistic scenario that the examiner may encounter in his or her profession. A vignette may form the basis of a single item or a set of items. Figures 7 and 8 present an example of a vignette with an individual item as well as a vignette with a set of items.

Mary, a food enthusiast, is traveling to Italy to explore its renowned culinary traditions. She finds herself in the beautiful region of Tuscany, famous for its rustic and flavorful dishes. As she ventures into a local trattoria, she notices a dish on the menu that particularly catches her attention: a hearty tomato-based stew with vegetables and bread. What is this dish known as in the region of Tuscany?

- A. Pasta alla Norma
- B. Bouillabaisse
- C. Ribolita*
- D. Coq au Vin

Figure 8. Example vignette with an individual item

Items 1 through 3 refer to the following case.

A 35-year-old patient with a low pain tolerance visits her dentist for a routine dental cleaning appointment. During the examination, the dentist notices plaque and tartar buildup on the patient's teeth, particularly in hard-to-reach areas. The dentist recommends a thorough dental cleaning procedure to remove the deposits and improve the patient's oral health. As part of the dental cleaning process, the dental hygienist uses specialized instruments to carefully remove the plaque and tartar from the tooth surfaces below the gum line. The procedure involves scaling, followed by polishing to smooth out the tooth surface and remove stains.

1. What is the primary purpose of the dental cleaning procedure for this patient?
 - A. To improve the aesthetics of the teeth
 - B. To prevent tooth decay and cavities*
 - C. To treat gum disease
 - D. To relieve tooth sensitivity

2. What is the purpose of scaling during this patient's procedure?
 - A. To remove stains and discoloration from the teeth
 - B. To allow for a further evaluation of oral health
 - C. To remove hardened plaque and tartar deposits*
 - D. To polish the teeth below the gumline

3. In consideration of the patient's low pain tolerance, what measure would typically be taken during this procedure to ensure their comfort level?
 - A. Administration of local anesthesia*
 - B. Use of light sedation
 - C. Application of numbing gel
 - D. Providing breaks during the cleaning

Figure 8. Vignette with a set of items

How to Begin Writing an Item

How to Write an Item

Items can be framed in a variety of ways and ideas for items can come from a variety of sources. Items should be focused on knowledge that is important for the examinee to know and critical for the examinee to understand to be successful on the respective examination. Items should also clearly align to the test specifications. Any item written that is not aligned to content being measured on the examination the item is being created for is a threat to the validity of the test scores.

Writing the Item Stem. The item stem is the foundation of the item writing process and is generally the first component of the item that is written. Table 2 presents some key considerations that item writers should think about when constructing the item stem. It also highlights things to avoid when writing the stem.

Table 2. How to write the item stem

The item stem should:	When writing the item stem:
Be focused on only one knowledge concept	Do not write items with multiple content objectives
Be focused and address a clearly defined problem; the stem should be able to be answered as a stand-alone question without seeing the item options	Do not write items such as “Which of the following is true (or false)?” This type of item poses a non-specific, unfocused question
Clearly align with the test specifications	Do not write items outside the test specifications
Be written in common vocabulary that is clear and concise	Do not include extraneous information
Be written in the positive	Avoid using NOT, LEAST, EXCEPT in the stem. This type of item asks the test taker to find the wrong answer as the key.

Writing the Response Options. When writing the item options, the item writer should adhere to the test design that is defined by the testing program. For example, the item writer should confirm the number of options needed for the items on the respective exam, and the number of correct answer keys. The following are important considerations when writing the item response options:

Table 3. Writing the item response options

The item options should:	When writing the item options
Be homogenous in content (same concepts).	Do not write options that subsume each other.
Be parallel in length and structure (similar in length).	Do not write items that directly contradict one another
Be clear and concise, with no extraneous information.	Avoid specific determiners such as ALWAYS and NEVER.
Fit logically and grammatically with the stem.	Does not include key words from the stem.
When writing numeric answer options, answer options should be sorted increasingly.	Do not use NONE OF THE ABOVE or ALL OF THE ABOVE.

Writing the Item Key. When writing the item key, the item writer should make sure that the key is the only correct answer option. The key should not stand out differently than the other options that are written in grammar, content, or length. The following are important considerations when writing the item response options.

Table 4. Writing the item key

The item key should:	When writing the item key:
Be the only correct answer.	Do not write options that include multiple correct answers.
Be similar in length and structure as the other item options.	Do not include more information that makes the correct answer (key) obvious to the examinee.
Fit logically and grammatically with the stem.	Does not include key words from the stem.

Writing the Distractors. Creating plausible distractors is the most difficult aspect of creating a high-quality item. The best distractors are either accurate statements that do not meet the full requirements of the problem or incorrect statements that seem correct to a novice professional.

It is helpful to consider the following questions when writing item distractors:

- What is a common error for solving this problem?
- What do individuals usually confuse this concept with?
- What mistakes does the individual make when performing this task?
- What are common misconceptions in the field?

Table 5. Writing the item distractors

The item distractors should:	When writing the item distractors:
Be plausible yet incorrect.	Do not make up terms.
Be based on common misconceptions or critical misunderstandings.	Do not try to trick the candidates.
Be of similar structure and content as the key and content in the stem.	Make sure that they cannot be defensible as the correct answer.

Referencing Items

Items should reflect consensus in the field and should always be referenced with supporting material(s).

References. For each item, a reference source should be provided. The reference source should include the name of the author, the book edition (if applicable), the year of the publication and the page number of the supporting evidence of the item key.

Rationale. The rationale behind the item should also be included with the item. This rationale can include a reference source such as a textbook page, or explanation of steps required to determine a solution.

Item Review

Item writers often feel relief after finishing an item writing assignment. However, that is just the first step in a long process of ensuring the quality of each item and the validity of resulting scores.

All items should be reviewed by at least one other subject matter expert (SME) before the item is pilot tested with examinees. The reason for the review process is to ensure validity from a quality control perspective. Irrelevant information can lead to possible challenges by examinees that the item is not valid, namely not focusing on measuring what is supposed to be assessed.

The item review process should be managed by the testing program coordinator or vendor that is responsible for the item bank management processes. Item writers and reviewers often benefit from a systematic item review process using an item review checklist that clearly defines to the reviewer what type of things to evaluate. Table A.1 in Appendix A presents an example item review checklist that can be used to guide item reviewers.

General Style Guidelines

ASC has developed these guidelines for writing and reviewing items to facilitate successful item development. It is important to follow these basic procedures so that the item writing process supports the intended examination.

Style

To reduce construct-irrelevant variance, items should be formatted as similarly as possible. All items should have the same font style and size, same number of options when feasible, and similar writing style/structure.

Appropriate Language and Context

Simple and clear language should be used that is consistent with the assessment. Jargon, slang, and specialized vocabulary that is irrelevant for the construct being assessed should be avoided. The maturity and educational level of the examinees should be considered in the item writing process. Language that is inappropriate in tone, such as being patronizing, insulting, elitist, or inflammatory should be avoided.

Avoiding Bias

When preparing assessment items, be sensitive to the possibility of unintentionally placing groups of candidates at an unfair disadvantage. Writing items for an examination requires special attention to the diversity of environments, backgrounds, beliefs, and cultures among test candidates.

To meet this goal, ASC follows specific standards that ensure that test items, the test does not include contain language, symbols, words, phrases, or examples that are generally regarded as sexist, racist, or otherwise potentially offensive, inappropriate, or negative toward any group.

Summary

Following proper item writing procedures is perhaps one of the most critical steps in ensuring that the examination produces scores that can be correctly interpreted as the items on an exam are the foundation of what is being assessed. Items should be fair, clear, and targeted to the exam specifications that the item is written for.

When beginning the item writing process, item writers should have a clear understanding of the type of item they are writing, clearly defined test specifications and an understanding of their item writing assignment for the testing program.

This guide has presented general item writing guidelines that can help support item writers in the item development process. It has included an overview of the structure of an item, the important characteristics of high-quality items, and an example workflow of the item writing process. Key elements in item development were defined and examples were provided to support item writers in their efforts to create valid and focused items for an examination. Item writers can use this guide as a tool along with other ancillary information (e.g., test specifications and specific testing program styles and rules) to help support them in their item writing efforts.

Appendix A. Item Review Checklist

Review	Checked?
All items cover the content that is recognized as important for the exam	
All items fit within the test specification content outline	
All items have positive stems	
All items are clear and concise, with no extraneous information	
The item type is aligned to the test design (e.g., single select multiple choice with 4-options)	
All questions include a reference and/or a rationale	
All items include a single correct answer key	
All items refrain from using jargon or language that is	
If graphical material or media is included, citations are provided	
Information on gender/race/ethnicity/age is only included when necessary to answer the question to avoid bias/stereotypes	



Item Writing Checklist

CHECKED	DESCRIPTION
	Each item covers core content that is important for the candidate to know for the exam
	Each item is written to a specific content area in the test specifications
	Each item stem is written in the positive (e.g., no use of EXCEPT, NOT, etc.)
	Each item stem is written in the correct tense (e.g., avoid the use of second person)
	Questions about specific numbers/percentages are included only if considered core knowledge
	Each item is clear and concise, with no unnecessary wording
	If any item includes graphical material, the media is original and not taken from a reference or the media is cited
	Each item is a single select multiple choice item with 4-options
	Each item has only one correct answer
	The answer options for each item are parallel in length and structure
	The distractor options for each item are feasible and realistic
	The correct answer to the item does not include: ALL OF THE ABOVE or NONE OF THE ABOVE
	Each item written includes an appropriate reference or rationale
	Information on gender and ethnicity is only included if necessary to answer the question to avoid bias/stereotypes



ABSA Test Specifications

Num	Content Area	Number of Items	Percent
1	Perioperative	70	50%
	Preoperative	8	
	Operative	59	
	General Surgery	15	
	Orthopedic Surgery	11	
	Plastic/Reconstructive Surgery	11	
	Gynecological Surgery	11	
	Varied Other Surgical Specialties	11	
	Postoperative	3	
2	General Surgical & Medical Knowledge	40	25%
	Asepsis	8	
	Surgical Anatomy	8	
	Terminology	8	
	CPR	8	
	Instrumentation	8	
3	Professional Practice Knowledge	32	20%
	Patient Safety/Risk Management	8	
	Code of Ethics/Scope of Practice	8	
	Emergency Protocols	8	
	OSHA/HIPPA	8	
4	Equipment & Technology Knowledge	8	5%
	Surgical Equipment	8	



ABSA Test Specifications

Num	Content Area	Number of Items	Percent
1	Perioperative	75	50%
	Preoperative	5	
	Operative	67	
	General Surgery	15	
	Orthopedic Surgery	13	
	Plastic/Reconstructive Surgery	13	
	Gynecological Surgery	13	
	Varied Other Surgical Specialties	13	
	Postoperative	3	
2	General Surgical & Medical Knowledge	59	39%
	Asepsis	4	
	Surgical Anatomy	20	
	Terminology	9	
	Basic Life Support (BLS)	4	
	Surgical Instrumentation & Equipment	7	
	General Medical Knowledge	15	
3	Professional Practice Knowledge	16	11%
	Patient Safety/Risk Management/Emergency Protocols	7	
	Code of Ethics/Scope of Practice	6	
	OSHA/HIPPA	3	

Appendix E:
American Board of Surgical Assistants, Inc.
Angoff Standard Setting Report

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Executive Summary

The American Board of Surgical Assistants, Inc. (ABSA) engaged Caveon to review a previously conducted Angoff performance standard-setting workshop results to provide a recommended cut score range for the ABSA Surgical Assistant - Certified examination. The cut score range is based upon Angoff predictions provided by the subject matter experts (SMEs) that participated in an Angoff performance standard-setting process.

This report documents the results of that meeting and suggests a performance standard cut score range for the ABSA Surgical Assistant - Certified examination. This report and the appendixes provide the data and analysis results that support the recommendations.

The Angoff performance standard setting was held on December 6, 2023, and was facilitated by ABSA. Ten SMEs performed both rounds at varying completion levels. The process included:

1. Review description and purpose of the exam
2. Overview of the test development and Angoff standard setting procedure
3. Discussion of the Minimally competent candidate (MCC)
4. Angoff Round 1 Ratings
5. Round 1 Feedback - Deltas

Round 1 ratings were done independently by the SMEs. Due to time constraints of the SMEs, some SMEs were unable to complete ratings for each item. The results were compiled and discussed once judgments were made for each of the 348 multiple-choice items.

During the time of the Angoff study, the ABSA had switched from ASC to Caveon. With Caveon hosting the exam and having access to all internal statistics and data the ABSA felt the need for stronger security of the testing items. Round 2 ratings were evaluated by the SMEs in a group setting out of normal sequence. The assigned difficulty ratings (1 easy to 5 hard) were reevaluated and or reclassified, in the appropriate domains.

Forms were created using a difficulty scale of 1 (easy) to 5 (hard) based on the SME expert knowledge in the field, of surgical medicine before the Angoff study was completed. After ratings were completed, a spreadsheet was developed for each form already created. The Angoff study was then performed on each form to develop a 'cut score' for each form.

The results of the Angoff study provided the following data:

- Form 1, standard average/difficulty of 72.64% with a cut score of 67.35%
- Form 2, standard average/difficulty of 72.86% with a cut score of 67.73%

The final recommended cut score range, based on the average of the SME's total Angoff ratings, is 104 to 105 points out of 150 or 60% to 70%. The average total rating, or the recommended single-point performance standard, is 69.53 points, or 69.53%. This would require that a candidate get 104 points out of a possible 150 correct in order to pass this form of the ABSA Surgical Assistant - Certified examination.

Recommendations

Angoff predictions are oftentimes the only viable source of data available to small programs creating multiple forms of a test. However, the test item, test performance, and Angoff predictions should be evaluated using candidate data once adequate candidate data has been collected.

Caveon recommends that ABSA conduct an in-service analysis when at least 100 candidates have taken each form of the test. Depending on the findings of the analysis, it may be necessary to rebalance the forms for difficulty and time. Caveon also recommends an empirical study to validate the performance standard cut score.

Responsibility for Final Decisions

Caveon has performed this work on behalf of ABSA. The resulting performance standard cut score range and other recommendations are just that – recommendations. ABSA may accept, reject, or modify these recommendations based on their knowledge and expertise of the content as well as the purpose of the exam, the target audience, and applicable stakeholders.

ABSA is responsible for the final decision regarding content of the test forms and the performance standard cut score.

The Angoff Procedure

The Angoff procedure is a widely accepted methodology for establishing the performance standard cut score for a test. The procedure relies upon the judgment of subject-matter experts who examine the content of each test item/task and predict the proportion of minimally qualified candidates that will answer the item correctly, or in this case, the proportion that will score at each of the possible score points. The average of the judges' predictions for a test item becomes the predicted difficulty of the test item. The sum of the predicted item difficulty values for each item averaged across the judges and items on a test form is the recommended cut score.

The difficulties were derived from the judgments of ten SMEs. The SMEs are identified in Table 1. Biographical information is on file with American Board of Surgical Assistants, Inc.

Table 1: Angoff Panel

Judge	Name	Credentials
1	Paul Weeks	MD, ScD/PhD, SA-C
2	Fahad Anwer	BS, SA-C
3	Darwin Nelson	DO, SA-C
4	Jean Guy Honore	MD, SA-C
5	Aide Paula	MD, SA-C
6	Preston Gantt	MD, SA-C
7	Chika Anthony Obimah	MD, SA-C
8	Sherral Hudson-Colbert	CST, SA-C
9	Ronald Zapata	MD, SA-C
10	Antonio Martinez	MD, SA-C

Performance Standard Cut Score Analysis

Table 2 shows the recommended performance standard cut score range as calculated for the items judged during Round 1. Table 3 provides individual ratings for each question and judge for Round 1. These are in the raw score scale, specifying the expected number of points for the minimally qualified examinee. Figure 1 shows the total Angoff rating for each judge as a percent score. Note the general consistency of the total ratings across judges and the small standard errors of the judgments.

Table 2: Round 1 Cut Score Range

69.53	Standard Average / Difficulty
16.85	Standard Deviation
6.37	Standard Error of Judge Means
0.34	Standard Error of Item Means
63.16	Computed Cut-Score
63% = 95/150	Suggested Cut-Score (manual)

Table 3: Round 1 Angoff Ratings

Item	SME 1	SME 2	SME 3	SME 4	SME 5	SME 6	SME 7	SME 8	SME 9	SME 10
Perioperative										
01.01 Pre Op1	40	50	90	70	37	40	50	70	50	
01.01 Pre Op2	77	100	90	80	16	100	97	50	80	
01.01 Pre Op3	94	100	90	90	31	100	100	49	70	
01.01 Pre Op4	59	80	90	70	28	99	90	80	60	
01.01 Pre Op5	96	80	90	80	27	100	75	20	83	
01.01 Pre Op6	30	70	90	80	20	100	100	80	100	
01.01 Pre Op7	95	80	90	90	39	25	100	80	73	
01.01 Pre Op8	65	70	90	90	28	100	100	25	76	
01.02.1 GS 41.1										
01.02.1 GS 1	100	50	90	95	13	50	100	27		
01.02.1 GS 11	86	65	80	85	21	100	100	25		
01.02.1 GS 12	51	76	80	80	19	100	100	25		
01.02.1 GS 13	89	50	90	60	22	100	100	80		
01.02.1 GS 14	25	46	80	70	26	100	60	80		
01.02.1 GS 15	72	72	90	65	20	100	100	80		
01.02.1 GS 16	90	87	90	95	30	100	100	50		
01.02.1 GS 17	78	62	90	90	31	100	100	50		
01.02.1 GS 2		45	90	70	29	100	100	80		
01.02.1 GS 20	100	50	90	80	36	100	100	80		
01.02.1 GS 21	89	30	80	80	17	100	75	50		
01.02.1 GS 22	96	100	90	80	21	100	75	20		
01.02.1 GS 23	79	67	90	90	31	100	100	25		
01.02.1 GS 25	75	80	80	70	38	100	100	25		
01.02.1 GS 26	80	90	90	90	18	50	100	25		
01.02.1 GS 28	68	100	90	70	30	100	100	25		
01.02.1 GS 29	75	100	90	90	29	100	100	50		
01.02.1 GS 32	95	71	90	85	28	100	100	50		
01.02.1 GS 37	98	88	90	80	34	100	100	50		

01.02.1 GS 38	14	66	80	70	26	38	70	50
01.02.1 GS 39	100	68	90	85	26	100	30	25
01.02.1 GS 4	76	100	90	85	26	100	100	25
01.02.1 GS 41								
01.02.1 GS 43	66	100	90	85	30	100	100	80
01.02.1 GS 44	98	100	80	80	24	100	100	25
01.02.1 GS 45	14	75	80	85	28	100	100	25
01.02.1 GS 46	51	57	70	80	27	100	100	25
01.02.1 GS 47	15	90	90	65	34	100	100	25
01.02.1 GS 48	17	90	80	70	47	100	100	25
01.02.1 GS 5	100	100	90	90	42	100	100	25
01.02.1 GS 50	79	100	80	70	43	100	100	25
01.02.1 GS 53	73	81	80	75	54	100	50	25
01.02.1 GS 55	88	90	90	85	51	100	80	50
01.02.1 GS 56	70	97	90	80	57	100	100	35
01.02.1 GS 57	82	64	90	95	64	100	100	30
01.02.1 GS 6	60	73	70	70	55	100	50	30
01.02.1 GS 60	80	75	80	85	54	100	80	35
01.02.1 GS 62	91	70	80	85	51	99		35
01.02.1 GS 8	97	100	90	90	51	100	50	50

01.02.2 OP 21	77	80	70	70	26	100	50	49
01.02.2 OP 22	94	96	90	90	19	100	100	57
01.02.2 OP 24	87	100	90	80	24	100	80	90
01.02.2 OP 25	96	98	80	70	27	100	100	80
01.02.2 OP 26	39	100	70	70	26	50	51	37
01.02.2 OP 27	99	80	70	90	29	100	100	40
01.02.2 OP 29	64	65	70	80	35	50	72	71
01.02.2 OP 32	76	70	70	65	36	98	32	80
01.02.2 OP 33	92	91	80	60	33	50	100	52
01.02.2 OP 34	68	70	70	70	25	100	97	31
01.02.2 OP 35	89	62	80	80	34	100	65	57
01.02.2 OP 36	46	70	90	65	33	61	83	56
01.02.2 OP 37	85	100	90	70	28	100	97	75
01.02.2 OP 38	98	100	90	70	33	100	99	75
01.02.2 OP 39	84	100	90	80	35	100	99	70
01.02.2 OP 40	83	100	90	80	42	100	98	76
01.02.2 OP 41	92	100	90	60	39	100	99	73
01.02.2 OP 42	100	100	90	60	37	100	98	71
01.02.2 OP 42.0	90	100	90	60	24	100	98	71
01.02.2 OP 43	77	71	90	65	25	100	100	73
01.02.2 OP 13	81	96	80	70	41	100	73	41
01.02.2 OP 15	48	91	90	60	36	100	76	40

01.02.2 OP 16	77	75	90	85	39	100	83	40
01.02.2 OP 17	67	79	80	55	37	100	94	34
01.02.2 OP 18	53	63	90	70	25	100	85	36
01.02.2 OP 19	47	90	90	80	25	100	80	45
01.02.2 OP 20	38	90	90	85	28	50	82	44
01.02.2 OP 3	15	77	70	70	37	50	80	49
01.02.2 OP 36.1	41	90	80	85	42	100	77	43
01.02.2 OP 36.2	43	94	80	80	36	100	98	57

01.02.3 PRS 10	100	83	90	65	16	99		59
01.02.3 PRS 11	78	45	80	70	17	100		58
01.02.3 PRS 12	81	42	90	80	20	99		60
01.02.3 PRS 13	90	64	80	85	16	98		45
01.02.3 PRS 14	88	47	90	70	24	53		36
01.02.3 PRS 15	71	43	90	60	18	99		44
01.02.3 PRS 16	92	72	90	65	23	99		43
01.02.3 PRS 17	76	59	90	65	21	99		37
01.02.3 PRS 18	33	50	90	85	25	99		40
01.02.3 PRS 19	75	100	90	60	24	99		40
01.02.3 PRS 20	35	100	90	60	22	100		50
01.02.3 PRS 21	50	100	90	75	27	50		48
01.02.3 PRS 8	41	49	90	80	68	100		49
01.02.3 PRS 9	26	50	90	75	61	99		47
01.02.3 PRS 1	71	69	90	65	67	100		46
01.02.3 PRS 2	51	47	90	50	63	99		47
01.02.3 PRS 3	74	33	90	50	48	100		43
01.02.3 PRS 4	39	23	90	85	62	100		48
01.02.3 PRS 6	90	57	90	80	57	100		50
01.02.3 PRS 7	70	21	90	75	44	99		47

01.02.4 GyS 11	62	50	80	65	38	100		72
01.02.4 GyS 12.1	27	19	90	80	16	100		51
01.02.4 GyS 14	33	19	90	75	11	100		61
01.02.4 GyS 15	20	82	70	65	28	100		53
01.02.4 GyS 16	14	36	80	90	46	99		60
01.02.4 GyS 17	88	32	80	95	31	100		47
01.02.4 GyS 18	72	41	90	90	34	99		51
01.02.4 GyS 19	88	44	90	80	42	100		57
01.02.4 GyS 2	29	47	90	70	36	100		57
01.02.4 GyS 20	29	49	90	75	41	100		48
01.02.4 GyS 21	74	60	90	90	24	100		63
01.02.4 GyS 22	39	63	90	90	29	100		77
01.02.4 GyS 23.1	31	67	90	80	24	100		79

01.02.4 GyS 24	21	60	90	80	26	100	84
01.02.4 GyS 7				65			
01.02.4 GyS 10	71	54	80	90	22	99	84
01.02.4 GyS 23	47	49	90	80	24	100	77
01.02.4 GyS 24.1	25	54	90	75	32	99	84
01.02.4 GyS 25				65			
01.02.4 GyS 27	86	40	80	70	33	99	54
01.02.4 GyS 29	58	54	90	70	35	99	54
01.02.4 GyS 30	66	61	90	70	42	99	51
01.02.4 GyS 30.1	50	63	90	70	56	99	62
01.02.4 GyS 4	55	66	70	75	56	100	47
01.02.5 VOSS 1	67	56	80	45	25	100	57
01.02.5 VOSS 10	78	74	90	50	29	100	64
01.02.5 VOSS 11	79	47	80	60	37	100	23
01.02.5 VOSS 12	82	48	80	85	44	100	79
01.02.5 VOSS 14	61	51	90	75	47	100	77
01.02.5 VOSS 15	73	54	70	70	46	100	17
01.02.5 VOSS 20	87	74	90	75	51	100	94
01.02.5 VOSS 24	31	75	90	70	40	100	89
01.02.5 VOSS 30	97	79	80	60	49	100	80
01.02.5 VOSS 13	48	10	90	60	51	99	81
01.02.5 VOSS 18	82	33	80	50	55	100	74
01.02.5 VOSS 19	88	31	80	65	60	100	71
01.02.5 VOSS 2	59	31	70	85	59	99	73
01.02.5 VOSS 21	62	60	70	80	64	100	63
01.02.5 VOSS 22	98	39	80	70	56	100	62
01.02.5 VOSS 23	86	23	80	70	44	99	60
01.02.5 VOSS 25	9	22	70	40	48	100	63
01.02.5 VOSS 28	9	24	80	40	45	50	59
01.02.5 VOSS 4	98	26	80	75	58	100	65
01.02.5 VOSS 5	58	25	80	75	54	100	65
01.02.5 VOSS 6	92	27	80	75	60	100	64
01.02.5 VOSS 7	13	28	80	70	54	100	66
01.02.5 VOSS 8	10	50	80	60	44	99	63
01.02.5 VOSS 9	15	54	90	50	52	100	67
01.03 Post Op 3	61	85	70	85	65	100	54
01.03 Post Op 4	65	75	70	75	60	100	45
01.03 Post Op 6	60	60	70	75	62	99	39
01.03 Post Op 7	60	85	70	75	64	100	48

General Surgical and Medical Knowledge

02.01 Asepsis 10	97	100	80	90	18	86
02.01 Asepsis 8	60	100	80	85	11	40
02.01 Asepsis 1	84	100	90	90	28	80
02.01 Asepsis 13	29	100	80	75	15	90
02.01 Asepsis 14	78	100	90	85	35	100
02.01 Asepsis 2	96	100	90	95	56	90
02.01 Asepsis 5	100	100	90	60	60	80
02.01 Asepsis 6	61	100	70	70	66	82
02.01 Asepsis 7	79	100	80	70	55	50
02.02 SA 1	60	99	60	85	48	
02.02 SA 11	71	85	80	75	37	
02.02 SA 12	61	86	80	70	49	
02.02 SA 13	76	82	80	90	61	
02.02 SA 15	60	71	80	95	51	
02.02 SA 3	72	59	70	75	47	
02.02 SA 32	60	69	90	80	72	
02.02 SA 36	31	77	80	60	61	
02.02 SA 37	71	60	90	85	54	
02.02 SA 38	84	69	90	99	67	
02.02 SA 39	89	78	90	90	53	
02.02 SA 4	12	68	80	75	45	
02.02 SA 43	29	59	80	60	60	
02.02 SA 44	30	66	80	55	55	
02.02 SA 45	16	56	70	80	54	
02.02 SA 88	61	64	80	90	48	
02.02 SA 46	32	63	80	70	54	
02.02 SA 46.1	28	58	80	75	46	
02.02 SA 52	13	69	90	90	49	
02.02 SA 55	31	69	90	85	62	
02.02 SA 14	100	98	70	90	58	
02.02 SA 16	17	100	60	60	53	
02.02 SA 17	76	61	70	85	60	
02.02 SA 18	38	75	80	85	57	
02.02 SA 20	20	87	80	60	39	
02.02 SA 21	50	100	70	75	37	
02.02 SA 24	11	100	70	70	22	
02.02 SA 27	15	100	70	70	34	
02.02 SA 28	51	77	80	65	31	
02.02 SA 35	60	80	90	80	67	
02.02 SA 40	29	52	70	65	33	
02.02 SA 41	27	50	70	60	19	
02.02 SA 42	29	100	70	75	19	

02.02 SA 48		69	90	60	19
02.02 SA 49	70	100	90	60	33
02.02 SA 50	68	82	90	60	37
02.02 SA 51	51	71	90	60	41
02.02 SA 53	22	94	90	90	37
02.02 SA 56	21	100	80	70	45
02.02 SA 57	35	100	70	80	44
02.02 SA 58	6	89	60	45	37
02.02 SA 59	24	82	60	75	35
02.02 SA 6	12	99	80	65	42
02.02 SA 60	20	78	70	75	64
02.02 SA 61	29	73	70	85	21
02.02 SA 63	5	89	70	70	21
02.02 SA 64	83	78	80	95	21
02.02 SA 65	61	75	90	85	21
02.02 SA 66	13	83	80	70	25
02.02 SA 67	83	87	90	75	33
02.02 SA 68	70	86	90	75	22
02.02 SA 69	78	64	90	70	39
02.02 SA 70	84	62	90	70	33
02.02 SA 71	74	68	90	70	40
02.02 SA 72	61	70	90	80	38
02.02 SA 73	50	81	90	80	55
02.02 SA 74	79	71	80	85	41
02.02 SA 75	74	74	70	55	21
02.02 SA 76	54	79	80	80	24
02.02 SA 77	36	81	90	70	36
02.02 SA 78	25	84	90	70	33
02.02 SA 79	69	77	90	95	34
02.02 SA 8	90	77	90	70	37
02.02 SA 81	97	89	70	70	29
02.02 SA 82	76	87	90	80	32
02.02 SA 84	60	95	80	65	32
02.02 SA 85	81	100	80	85	30
02.02 SA 87	96	81	70	90	11
02.02 SA 9	92	81	80	70	32
02.02 SA 92	47	84	80	90	16
02.02 SA 30	16	71	90	80	13

02.03 Terms 1	99	71	70	80	17
02.03 Terms 11	80	56	80	90	15
02.03 Terms 12	100	50	80	85	18
02.03 Terms 14	74	42	80	98	26

02.03 Terms 18	100	46	90	96	16
02.03 Terms 19	96	47	90	95	27
02.03 Terms 2	77	55	90	99	22
02.03 Terms 20	95	57	90	100	33
02.03 Terms 21	97	54	90	95	29
02.03 Terms 22	100	54	90	95	31
02.03 Terms 23	97	55	90	95	10
02.03 Terms 24	81	56	90	90	9
02.03 Terms 25	79	60	90	90	
02.03 Terms 26	94	63	90	85	15
02.03 Terms 27	99	56	90	95	13
02.03 Terms 28	98	52	90	65	21
02.03 Terms 29	61	72	80	80	22
02.03 Terms 30	72	59	80	70	14
02.03 Terms 31	73	60	80	90	19
02.03 Terms 4	92	58	90	75	17
02.03 Terms 8	51	64	90	80	20

02.04 BLS 1	75	52	90	95	14
02.04 BLS 10	61	78	90	90	18
02.04 BLS 13	76	72	90	75	16
02.04 BLS 14	50	65	90	75	21
02.04 BLS 15	94	78	90	75	10
02.04 BLS 16	76	80	90	70	8
02.04 BLS 17	75	46	90	70	5
02.04 BLS 2	97	67	90	75	18
02.04 BLS 3 clone	91	65	90	80	16
02.04 BLS 5	73	77	90	75	19
02.04 BLS 6	60	81	90	85	14
02.04 BLS 7 clone	61	100	90	85	14
02.04 BLS 8	82	70	90	70	4
02.04 BLS 9	60	97	90	75	12

02.05 SI&E 47	100	82	90	90	15
02.05 SI&E 47.0	70	89	90	80	10
02.05 SI&E 48	100	100	90	90	9
02.05 SI&E 49	100	100	90	90	24
02.05 SI&E 50	50	100	80	70	37
02.05 SI&E 50.0	93	100	90	85	22
02.05 SI&E 51	60	100	90	85	20
02.05 SI&E 11	70	100	90	75	19
02.05 SI&E 12	60	100	80	75	20
02.05 SI&E 16	61	100	90	85	23

02.05 SI&E 17	21	100	90	65	19
02.05 SI&E 18	97	100	90	90	24
02.05 SI&E 19	89	100	90	85	22
02.05 SI&E 2	78	100	90	90	22
02.05 SI&E 20	66	100	90	75	18
02.05 SI&E 22	76	100	90	75	14
02.05 SI&E 23	21	100	90	95	15
02.05 SI&E 24	93	100	90	75	44
02.05 SI&E 25	60	100	90	95	23
02.05 SI&E 27	96	100	90	70	19
02.05 SI&E 30	91	99	90	85	22
02.05 SI&E 31	87	100	90	75	32
02.05 SI&E 32	85	98	90	75	21
02.05 SI&E 34	100	100	90	90	51
02.05 SI&E 38	96	100	90	95	16
02.05 SI&E 39	87	98	90	85	41
02.05 SI&E 4	80	100	80	80	54
02.05 SI&E 41	96	100	90	80	46
02.05 SI&E 45	68	100	80	70	52
02.05 SI&E 9	48	100	80	98	50

02.06 GMK 10	19	21	70	90	18
02.06 GMK 11	79	100	90	90	28
02.06 GMK 12	93	89	90	95	21
02.06 GMK 13	17	96	90	65	31
02.06 GMK 14	33	100	90	75	36
02.06 GMK 15	26	100	90	80	36
02.06 GMK 17	26	83	90	65	32
02.06 GMK 18	41	94	90	70	23
02.06 GMK 20	77	80	90	75	27
02.06 GMK 22	42	84	80	70	30
02.06 GMK 24	24	100	80	85	39
02.06 GMK 29	100	100	90	85	32
02.06 GMK 3	28	100	90	70	21
02.06 GMK 30	37	100	90	85	29
02.06 GMK 31	46	99	90	75	33
02.06 GMK 32	78	100	90	95	21
02.06 GMK 33	41	62	90	65	24
02.06 GMK 35	96	54	90	90	34
02.06 GMK 36	89	50	90	90	31
02.06 GMK 37	97	61	90	80	29
02.06 GMK 38	76	78	90	90	42
02.06 GMK 4	52	78	90	60	35

02.06 GMK 4.3	99	79	90	80	40
02.06 GMK 4.4	50	82	90	60	36
02.06 GMK 40	90	80	90	75	33
02.06 GMK 41	73	83	90	90	40
02.06 GMK 34	96	89	80	85	40

Professional Practice Knowledge

03.01 PS/RM/EP 1	68	80	90	85	42	99	46
03.01 PS/RM/EP 10	91	52	90	90	76	99	55
03.01 PS/RM/EP 12	40	94	90	90	74		52
03.01 PS/RM/EP 13	60	85	90	95	82	100	87
03.01 PS/RM/EP 14	61	96	90	90	91	100	63
03.01 PS/RM/EP 15	39	84	90	85	80	100	69
03.01 PS/RM/EP 16	49	92	90	80	77	100	70
03.01 PS/RM/EP 17	34	100	90	90	70	100	78
03.01 PS/RM/EP 4	35	100	90	85	87	100	73
03.01 PS/RM/EP 5	72	82	90	85	86	100	76
03.01 PS/RM/EP 6	96	100	90	75	89	100	84
03.01 PS/RM/EP 7	60	100	90	90	80	100	74

03.02 Ethics 11	60	84	90	95	85	100	68
03.02 Ethics 1	80	83	90	95	83	100	67
03.02 Ethics 10	60	100	90	90	87	100	72
03.02 Ethics 2	35	100	90	95	89	100	65
03.02 Ethics 4	50	100	90	75	90	100	76
03.02 Ethics 5	87	100	90	90	90	100	75
03.02 Ethics 6	18	100	90	90	88	100	75
03.02 Ethics 8	13	100	90	80	88	100	71
03.02 Ethics 9	29	100	90	80	88	100	72

03.03 O/HIPAA 1	10	100	90	70	100	100		91		
03.03 O/HIPAA 2	13	85	90	70	100	100		87		
03.03 O/HIPAA 3	27	90	90	70	100	99		79		
Average	63.90	75.70	84.94	77.49	37.41	95.47	87.71	55.92	74.00	77.56

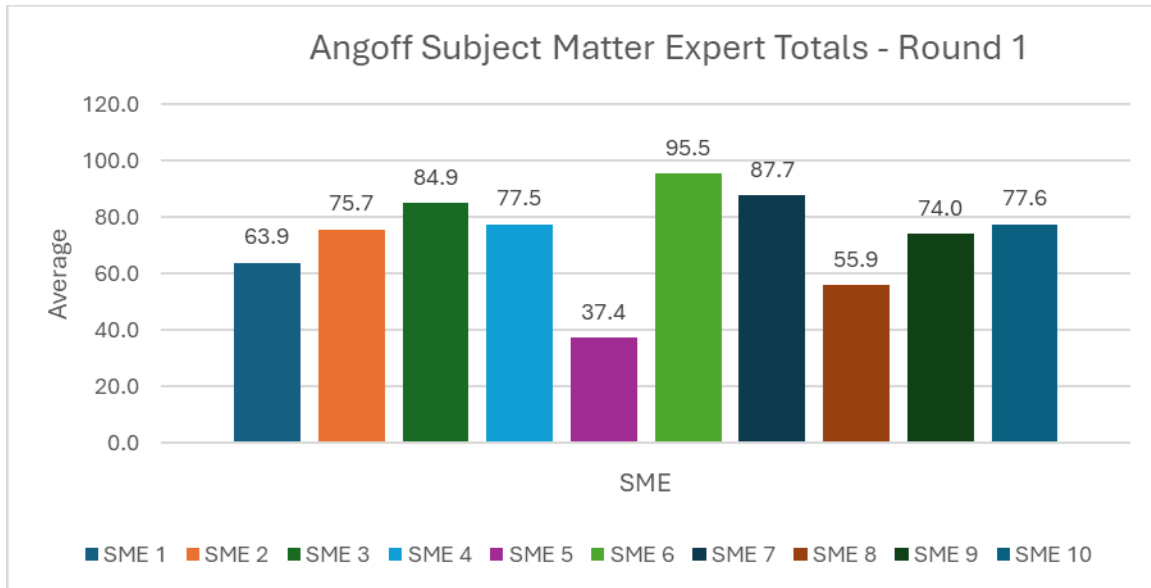


Figure 1: Total Angoff ratings for each judge for Round 1

Table 4 shows the recommended performance standard cut score range as calculated removing aberrant results. Table 5 provides individual ratings for each question and judge after removing aberrant results. These are in the raw score scale, specifying the expected number of points for the minimally qualified examinee. Figure 2 shows the total Angoff rating for each judge as a percent score.

When determining the actual performance standard cut score, take the following considerations into account:

1. Do you believe the Angoff judges had an accurate picture of the minimally qualified candidate, and that they accurately represented the minimally qualified candidate in their predictions?

If yes, then use the mean Angoff judgment as the performance standard cut score. The mean scores are highlighted in yellow background.

If no and the judges expected too much of the minimally qualified candidate, then adjust the performance standard cut score downward from the mean using the standard errors.

If no and the judges expected too little of the minimally qualified candidate, then adjust the cut score upward from the mean using the standard errors.

2. If you are adjusting the cut score down, what are the potential consequences if a candidate in the area of the cut score passes the test, but does not actually meet the conceptual standard of the minimally qualified candidate?
3. If you are adjusting the cut score up, what are the potential consequences if a candidate in the area of the cut score fails the test despite meeting or exceeding the conceptual standard of the minimally qualified candidate?

The cut score was adjusted taking into account very low/high scores given by SMEs 5 & 6. Therefore, their input was not used in the final score decision factors for the passing score determined.

Table 4: Final Cut Score Range

74.20	Standard Average / Difficulty
10.43	Standard Deviation
4.66	Standard Error of Judge Means
0.25	Standard Error of Item Means
69.53	Computed Cut-Score
69% = 104/150	Suggested Cut-Score (manual)

Table 5: Final Angoff Ratings

Item	SME 1	SME 2	SME 3	SME 4	SME 7	SME 8	SME 9	SME 10
Perioperative								
01.01 Pre Op1	40	50	90	70	50	70	50	
01.01 Pre Op2	77	100	90	80	97	50	80	
01.01 Pre Op3	94	100	90	90	100	49	70	
01.01 Pre Op4	59	80	90	70	90	80	60	
01.01 Pre Op5	96	80	90	80	75	20	83	
01.01 Pre Op6	30	70	90	80	100	80	100	
01.01 Pre Op7	95	80	90	90	100	80	73	
01.01 Pre Op8	65	70	90	90	100	25	76	
01.02.1 GS 41.1								
01.02.1 GS 1	100	50	90	95	100	27		
01.02.1 GS 11	86	65	80	85	100	25		
01.02.1 GS 12	51	76	80	80	100	25		
01.02.1 GS 13	89	50	90	60	100	80		
01.02.1 GS 14	25	46	80	70	60	80		
01.02.1 GS 15	72	72	90	65	100	80		
01.02.1 GS 16	90	87	90	95	100	50		
01.02.1 GS 17	78	62	90	90	100	50		
01.02.1 GS 2		45	90	70	100	80		
01.02.1 GS 20	100	50	90	80	100	80		
01.02.1 GS 21	89	30	80	80	75	50		
01.02.1 GS 22	96	100	90	80	75	20		
01.02.1 GS 23	79	67	90	90	100	25		
01.02.1 GS 25	75	80	80	70	100	25		
01.02.1 GS 26	80	90	90	90	100	25		
01.02.1 GS 28	68	100	90	70	100	25		
01.02.1 GS 29	75	100	90	90	100	50		

01.02.1 GS 32	95	71	90	85	100	50
01.02.1 GS 37	98	88	90	80	100	50
01.02.1 GS 38	14	66	80	70	70	50
01.02.1 GS 39	100	68	90	85	30	25
01.02.1 GS 4	76	100	90	85	100	25
01.02.1 GS 41						
01.02.1 GS 43	66	100	90	85	100	80
01.02.1 GS 44	98	100	80	80	100	25
01.02.1 GS 45	14	75	80	85	100	25
01.02.1 GS 46	51	57	70	80	100	25
01.02.1 GS 47	15	90	90	65	100	25
01.02.1 GS 48	17	90	80	70	100	25
01.02.1 GS 5	100	100	90	90	100	25
01.02.1 GS 50	79	100	80	70	100	25
01.02.1 GS 53	73	81	80	75	50	25
01.02.1 GS 55	88	90	90	85	80	50
01.02.1 GS 56	70	97	90	80	100	35
01.02.1 GS 57	82	64	90	95	100	30
01.02.1 GS 6	60	73	70	70	50	30
01.02.1 GS 60	80	75	80	85	80	35
01.02.1 GS 62	91	70	80	85		35
01.02.1 GS 8	97	100	90	90	50	50

01.02.2 OP 21	77	80	70	70	50	49
01.02.2 OP 22	94	96	90	90	100	57
01.02.2 OP 24	87	100	90	80	80	90
01.02.2 OP 25	96	98	80	70	100	80
01.02.2 OP 26	39	100	70	70	51	37
01.02.2 OP 27	99	80	70	90	100	40
01.02.2 OP 29	64	65	70	80	72	71
01.02.2 OP 32	76	70	70	65	32	80
01.02.2 OP 33	92	91	80	60	100	52
01.02.2 OP 34	68	70	70	70	97	31
01.02.2 OP 35	89	62	80	80	65	57
01.02.2 OP 36	46	70	90	65	83	56
01.02.2 OP 37	85	100	90	70	97	75
01.02.2 OP 38	98	100	90	70	99	75
01.02.2 OP 39	84	100	90	80	99	70
01.02.2 OP 40	83	100	90	80	98	76
01.02.2 OP 41	92	100	90	60	99	73
01.02.2 OP 42	100	100	90	60	98	71
01.02.2 OP 42.0	90	100	90	60	98	71
01.02.2 OP 43	77	71	90	65	100	73

01.02.2 OP 13	81	96	80	70	73	41
01.02.2 OP 15	48	91	90	60	76	40
01.02.2 OP 16	77	75	90	85	83	40
01.02.2 OP 17	67	79	80	55	94	34
01.02.2 OP 18	53	63	90	70	85	36
01.02.2 OP 19	47	90	90	80	80	45
01.02.2 OP 20	38	90	90	85	82	44
01.02.2 OP 3	15	77	70	70	80	49
01.02.2 OP 36.1	41	90	80	85	77	43
01.02.2 OP 36.2	43	94	80	80	98	57
01.02.3 PRS 10	100	83	90	65		59
01.02.3 PRS 11	78	45	80	70		58
01.02.3 PRS 12	81	42	90	80		60
01.02.3 PRS 13	90	64	80	85		45
01.02.3 PRS 14	88	47	90	70		36
01.02.3 PRS 15	71	43	90	60		44
01.02.3 PRS 16	92	72	90	65		43
01.02.3 PRS 17	76	59	90	65		37
01.02.3 PRS 18	33	50	90	85		40
01.02.3 PRS 19	75	100	90	60		40
01.02.3 PRS 20	35	100	90	60		50
01.02.3 PRS 21	50	100	90	75		48
01.02.3 PRS 8	41	49	90	80		49
01.02.3 PRS 9	26	50	90	75		47
01.02.3 PRS 1	71	69	90	65		46
01.02.3 PRS 2	51	47	90	50		47
01.02.3 PRS 3	74	33	90	50		43
01.02.3 PRS 4	39	23	90	85		48
01.02.3 PRS 6	90	57	90	80		50
01.02.3 PRS 7	70	21	90	75		47
01.02.4 GyS 11	62	50	80	65		72
01.02.4 GyS 12.1	27	19	90	80		51
01.02.4 GyS 14	33	19	90	75		61
01.02.4 GyS 15	20	82	70	65		53
01.02.4 GyS 16	14	36	80	90		60
01.02.4 GyS 17	88	32	80	95		47
01.02.4 GyS 18	72	41	90	90		51
01.02.4 GyS 19	88	44	90	80		57
01.02.4 GyS 2	29	47	90	70		57
01.02.4 GyS 20	29	49	90	75		48
01.02.4 GyS 21	74	60	90	90		63

01.02.4 GyS 22	39	63	90	90	77
01.02.4 GyS 23.1	31	67	90	80	79
01.02.4 GyS 24	21	60	90	80	84
01.02.4 GyS 7				65	
01.02.4 GyS 10	71	54	80	90	84
01.02.4 GyS 23	47	49	90	80	77
01.02.4 GyS 24.1	25	54	90	75	84
01.02.4 GyS 25				65	
01.02.4 GyS 27	86	40	80	70	54
01.02.4 GyS 29	58	54	90	70	54
01.02.4 GyS 30	66	61	90	70	51
01.02.4 GyS 30.1	50	63	90	70	62
01.02.4 GyS 4	55	66	70	75	47
01.02.5 VOSS 1	67	56	80	45	57
01.02.5 VOSS 10	78	74	90	50	64
01.02.5 VOSS 11	79	47	80	60	23
01.02.5 VOSS 12	82	48	80	85	79
01.02.5 VOSS 14	61	51	90	75	77
01.02.5 VOSS 15	73	54	70	70	17
01.02.5 VOSS 20	87	74	90	75	94
01.02.5 VOSS 24	31	75	90	70	89
01.02.5 VOSS 30	97	79	80	60	80
01.02.5 VOSS 13	48	10	90	60	81
01.02.5 VOSS 18	82	33	80	50	74
01.02.5 VOSS 19	88	31	80	65	71
01.02.5 VOSS 2	59	31	70	85	73
01.02.5 VOSS 21	62	60	70	80	63
01.02.5 VOSS 22	98	39	80	70	62
01.02.5 VOSS 23	86	23	80	70	60
01.02.5 VOSS 25	9	22	70	40	63
01.02.5 VOSS 28	9	24	80	40	59
01.02.5 VOSS 4	98	26	80	75	65
01.02.5 VOSS 5	58	25	80	75	65
01.02.5 VOSS 6	92	27	80	75	64
01.02.5 VOSS 7	13	28	80	70	66
01.02.5 VOSS 8	10	50	80	60	63
01.02.5 VOSS 9	15	54	90	50	67
01.03 Post Op 3	61	85	70	85	54
01.03 Post Op 4	65	75	70	75	45
01.03 Post Op 6	60	60	70	75	39
01.03 Post Op 7	60	85	70	75	48

General Surgical and Medical Knowledge

02.01 Asepsis 10	97	100	80	90	86
02.01 Asepsis 8	60	100	80	85	40
02.01 Asepsis 1	84	100	90	90	80
02.01 Asepsis 13	29	100	80	75	90
02.01 Asepsis 14	78	100	90	85	100
02.01 Asepsis 2	96	100	90	95	90
02.01 Asepsis 5	100	100	90	60	80
02.01 Asepsis 6	61	100	70	70	82
02.01 Asepsis 7	79	100	80	70	50

02.02 SA 1	60	99	60	85
02.02 SA 11	71	85	80	75
02.02 SA 12	61	86	80	70
02.02 SA 13	76	82	80	90
02.02 SA 15	60	71	80	95
02.02 SA 3	72	59	70	75
02.02 SA 32	60	69	90	80
02.02 SA 36	31	77	80	60
02.02 SA 37	71	60	90	85
02.02 SA 38	84	69	90	99
02.02 SA 39	89	78	90	90
02.02 SA 4	12	68	80	75
02.02 SA 43	29	59	80	60
02.02 SA 44	30	66	80	55
02.02 SA 45	16	56	70	80
02.02 SA 88	61	64	80	90
02.02 SA 46	32	63	80	70
02.02 SA 46.1	28	58	80	75
02.02 SA 52	13	69	90	90
02.02 SA 55	31	69	90	85
02.02 SA 14	100	98	70	90
02.02 SA 16	17	100	60	60
02.02 SA 17	76	61	70	85
02.02 SA 18	38	75	80	85
02.02 SA 20	20	87	80	60
02.02 SA 21	50	100	70	75
02.02 SA 24	11	100	70	70
02.02 SA 27	15	100	70	70
02.02 SA 28	51	77	80	65
02.02 SA 35	60	80	90	80
02.02 SA 40	29	52	70	65

02.02 SA 41	27	50	70	60
02.02 SA 42	29	100	70	75
02.02 SA 48		69	90	60
02.02 SA 49	70	100	90	60
02.02 SA 50	68	82	90	60
02.02 SA 51	51	71	90	60
02.02 SA 53	22	94	90	90
02.02 SA 56	21	100	80	70
02.02 SA 57	35	100	70	80
02.02 SA 58	6	89	60	45
02.02 SA 59	24	82	60	75
02.02 SA 6	12	99	80	65
02.02 SA 60	20	78	70	75
02.02 SA 61	29	73	70	85
02.02 SA 63	5	89	70	70
02.02 SA 64	83	78	80	95
02.02 SA 65	61	75	90	85
02.02 SA 66	13	83	80	70
02.02 SA 67	83	87	90	75
02.02 SA 68	70	86	90	75
02.02 SA 69	78	64	90	70
02.02 SA 70	84	62	90	70
02.02 SA 71	74	68	90	70
02.02 SA 72	61	70	90	80
02.02 SA 73	50	81	90	80
02.02 SA 74	79	71	80	85
02.02 SA 75	74	74	70	55
02.02 SA 76	54	79	80	80
02.02 SA 77	36	81	90	70
02.02 SA 78	25	84	90	70
02.02 SA 79	69	77	90	95
02.02 SA 8	90	77	90	70
02.02 SA 81	97	89	70	70
02.02 SA 82	76	87	90	80
02.02 SA 84	60	95	80	65
02.02 SA 85	81	100	80	85
02.02 SA 87	96	81	70	90
02.02 SA 9	92	81	80	70
02.02 SA 92	47	84	80	90
02.02 SA 30	16	71	90	80

02.03 Terms 1	99	71	70	80
02.03 Terms 11	80	56	80	90

02.03 Terms 12	100	50	80	85
02.03 Terms 14	74	42	80	98
02.03 Terms 18	100	46	90	96
02.03 Terms 19	96	47	90	95
02.03 Terms 2	77	55	90	99
02.03 Terms 20	95	57	90	100
02.03 Terms 21	97	54	90	95
02.03 Terms 22	100	54	90	95
02.03 Terms 23	97	55	90	95
02.03 Terms 24	81	56	90	90
02.03 Terms 25	79	60	90	90
02.03 Terms 26	94	63	90	85
02.03 Terms 27	99	56	90	95
02.03 Terms 28	98	52	90	65
02.03 Terms 29	61	72	80	80
02.03 Terms 30	72	59	80	70
02.03 Terms 31	73	60	80	90
02.03 Terms 4	92	58	90	75
02.03 Terms 8	51	64	90	80

02.04 BLS 1	75	52	90	95
02.04 BLS 10	61	78	90	90
02.04 BLS 13	76	72	90	75
02.04 BLS 14	50	65	90	75
02.04 BLS 15	94	78	90	75
02.04 BLS 16	76	80	90	70
02.04 BLS 17	75	46	90	70
02.04 BLS 2	97	67	90	75
02.04 BLS 3 clone	91	65	90	80
02.04 BLS 5	73	77	90	75
02.04 BLS 6	60	81	90	85
02.04 BLS 7 clone	61	100	90	85
02.04 BLS 8	82	70	90	70
02.04 BLS 9	60	97	90	75

02.05 SI&E 47	100	82	90	90
02.05 SI&E 47.0	70	89	90	80
02.05 SI&E 48	100	100	90	90
02.05 SI&E 49	100	100	90	90
02.05 SI&E 50	50	100	80	70
02.05 SI&E 50.0	93	100	90	85
02.05 SI&E 51	60	100	90	85
02.05 SI&E 11	70	100	90	75

02.05 SI&E 12	60	100	80	75
02.05 SI&E 16	61	100	90	85
02.05 SI&E 17	21	100	90	65
02.05 SI&E 18	97	100	90	90
02.05 SI&E 19	89	100	90	85
02.05 SI&E 2	78	100	90	90
02.05 SI&E 20	66	100	90	75
02.05 SI&E 22	76	100	90	75
02.05 SI&E 23	21	100	90	95
02.05 SI&E 24	93	100	90	75
02.05 SI&E 25	60	100	90	95
02.05 SI&E 27	96	100	90	70
02.05 SI&E 30	91	99	90	85
02.05 SI&E 31	87	100	90	75
02.05 SI&E 32	85	98	90	75
02.05 SI&E 34	100	100	90	90
02.05 SI&E 38	96	100	90	95
02.05 SI&E 39	87	98	90	85
02.05 SI&E 4	80	100	80	80
02.05 SI&E 41	96	100	90	80
02.05 SI&E 45	68	100	80	70
02.05 SI&E 9	48	100	80	98

02.06 GMK 10	19	21	70	90
02.06 GMK 11	79	100	90	90
02.06 GMK 12	93	89	90	95
02.06 GMK 13	17	96	90	65
02.06 GMK 14	33	100	90	75
02.06 GMK 15	26	100	90	80
02.06 GMK 17	26	83	90	65
02.06 GMK 18	41	94	90	70
02.06 GMK 20	77	80	90	75
02.06 GMK 22	42	84	80	70
02.06 GMK 24	24	100	80	85
02.06 GMK 29	100	100	90	85
02.06 GMK 3	28	100	90	70
02.06 GMK 30	37	100	90	85
02.06 GMK 31	46	99	90	75
02.06 GMK 32	78	100	90	95
02.06 GMK 33	41	62	90	65
02.06 GMK 35	96	54	90	90
02.06 GMK 36	89	50	90	90
02.06 GMK 37	97	61	90	80

02.06 GMK 38	76	78	90	90
02.06 GMK 4	52	78	90	60
02.06 GMK 4.3	99	79	90	80
02.06 GMK 4.4	50	82	90	60
02.06 GMK 40	90	80	90	75
02.06 GMK 41	73	83	90	90
02.06 GMK 34	96	89	80	85

Professional Practice Knowledge

03.01 PS/RM/EP 1	68	80	90	85	46
03.01 PS/RM/EP 10	91	52	90	90	55
03.01 PS/RM/EP 12	40	94	90	90	52
03.01 PS/RM/EP 13	60	85	90	95	87
03.01 PS/RM/EP 14	61	96	90	90	63
03.01 PS/RM/EP 15	39	84	90	85	69
03.01 PS/RM/EP 16	49	92	90	80	70
03.01 PS/RM/EP 17	34	100	90	90	78
03.01 PS/RM/EP 4	35	100	90	85	73
03.01 PS/RM/EP 5	72	82	90	85	76
03.01 PS/RM/EP 6	96	100	90	75	84
03.01 PS/RM/EP 7	60	100	90	90	74

03.02 Ethics 11	60	84	90	95	68
03.02 Ethics 1	80	83	90	95	67
03.02 Ethics 10	60	100	90	90	72
03.02 Ethics 2	35	100	90	95	65
03.02 Ethics 4	50	100	90	75	76
03.02 Ethics 5	87	100	90	90	75
03.02 Ethics 6	18	100	90	90	75
03.02 Ethics 8	13	100	90	80	71
03.02 Ethics 9	29	100	90	80	72

03.03 OSHA/HIPAA 1	10	100	90	70	91			
03.03 OSHA/HIPAA 2	13	85	90	70	87			
03.03 OSHA/HIPAA 3	27	90	90	70	79			
Average	63.90	75.70	84.94	77.49	87.71	55.92	74.00	77.56

Figure 2: Total Angoff ratings for each judge – Final

