

FE EXAM KNOWLEDGE QUIZ

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SPRING 2022

1

Why this Quiz?

1. Dispel certain myths about the FE Exam.
2. Increase your knowledge of the FE Exam
3. Introduce you to some helpful resources

***Think of this quiz as a learning opportunity!
... as ALL tests are meant to be***

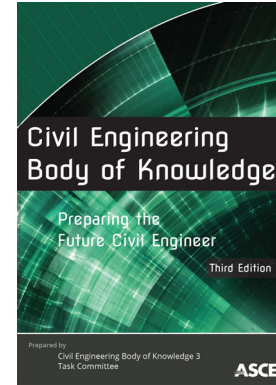
2

Professional Responsibilities

Table 2-20a. Professional Responsibilities (Cognitive Domain).

Cognitive Domain Level of Achievement	Demonstrated Ability	Typical Pathway
1 Remember (remember previously learned material)	Identify professional responsibilities relevant to the practice of civil engineering, including safety, legal issues, licensure , credentialing, and innovation.	Undergraduate education
2 Comprehend (grasp the meaning of learned material)	Explain professional responsibilities relevant to the practice of civil engineering, including safety, legal issues, licensure , credentialing, and innovation.	Undergraduate education

Affective Domain Level of Achievement	Demonstrated Ability	Typical Pathway
1 Receive (be aware of, willing to receive, and be attentive to a particular phenomenon or behavior)	Acknowledge professional responsibilities relevant to the practice of civil engineering including safety, legal issues, licensure , credentialing, and innovation.	Undergraduate education
2 Respond (actively participate in activity, attend to task, react to motivation)	Examine professional responsibilities relevant to the practice of civil engineering including safety, legal issues, licensure , credentialing, and innovation.	Undergraduate education



3

Q1

According to the NCEES Examinee Guide, for the FE Exam, the CIVIL CBT FE Exam has the following number of questions:

- A. 55
- B. 60
- C. 110
- D. 180

4

A1

C. 110

Exam Format

The exam is divided into two sections. You'll be given the entire exam time at the beginning of the test. There are no individually timed sections, so manage your time accordingly.

Exam	Testing Date	Appointment time	Nondisclosure Agreement	Tutorial	Exam time	Scheduled break	Number of questions
FE/FS	Year-Round	5 hr 55 min	2 min	8 min	5 hr 20 min	25 min	110

After you see approximately half of the questions, you will be prompted to review and then submit them. You will no longer have access to those questions after you submit them. You will then have the option of taking a scheduled break (see next section). Manage your time accordingly to ensure that you have plenty of time to complete the remaining questions.

NCEES EXAMINEE GUIDE June 1, 2020

NCEES exams are administered in either a computer-based format (CBT) or a pencil-and-paper format. Click on the appropriate section below for your exam.

[Click here for information about our COVID-19 response.](#)

COMPUTER-BASED EXAMS (CBT) 2

- Fundamentals of Engineering (FE)
- Fundamentals of Surveys (FS)
- Principles and Practice of Engineering (PPE)
- Principles and Practice of Engineering (PPE) - Electrical
- Environmental
- Fire Protection
- Industrial and Systems
- Mechanical (all subfields)
- Water
- Professional

PENCIL-AND-PAPER EXAMS 20

[Click here for important information about changes to the October 2020 pencil-and-paper exam administration.](#)

- Principles and Practice of Engineering (PPE)
- Principles and Practice of Engineering (PPE) - Agricultural and Biological Engineering
- Principles and Practice of Engineering (PPE) - Architectural Engineering
- Principles and Practice of Engineering (PPE) - Civil (all subfields)
- Principles and Practice of Engineering (PPE) - Chemical
- Principles and Practice of Engineering (PPE) - Electrical and Computer Engineering
- Principles and Practice of Engineering (PPE) - Environmental, Civil, and Communications
- Principles and Practice of Engineering (PPE) - Geomatics and Geospatial
- Principles and Practice of Engineering (PPE) - Industrial and Manufacturing
- Principles and Practice of Engineering (PPE) - Mechanical and Materials
- Principles and Practice of Engineering (PPE) - Mining and Metallurgical Engineering
- Principles and Practice of Engineering (PPE) - Naval Architecture and Marine Engineering
- Principles and Practice of Engineering (PPE) - Other Disciplines Engineering

APPENDIX 35

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Q2

NCEES provides accommodations for individuals with documented disabilities:

- A. TRUE
- B. FALSE

A2

• A. TRUE

Exam Accommodations

Accommodations are available for examinees who meet certain eligibility criteria and sufficiently document their request. Examinees who have a **documented disability covered under the ADA** or a **scheduling conflict due to a religious Sabbath** or a **military appointment** may request accommodations. You must indicate your need for accommodations during the registration process. After registration is completed, you will receive an email with instructions on how to complete and submit your request for accommodations.

Email questions related to the accommodations process to NCEES at accommodations@ncees.org.

NCEES EXAMINEE GUIDE		June 1, 2020
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COMPUTER-BASED EXAMS (CBT) 2		
<ul style="list-style-type: none"> Foundations of Engineering (FE) Foundations of Science (FS) Principles and Practice of Engineering (PPE) Principles and Practice of Engineering (PPE) - Electrical Environmental Fire Protection Industrial and Systems Mechanical and Industrial Water Professional 		
PENCIL-AND-PAPER EXAMS 20		
<p>Click here for important information about changes to the October 2020 pencil-and-paper exam administration.</p>		
<ul style="list-style-type: none"> Principles and Practice of Engineering (PPE) Agricultural and Biological Engineering Architectural Engineering Civil and Environmental Control Systems Electrical and Computer Computer Engineering Electrical and Computer Electronics, Controls, and Communications Estimate and Computer Power 	<ul style="list-style-type: none"> FE (continued) Manufacturing and Materials Mining and Metallurgical Engineering Nuclear Architecture and Nuclear Engineering Other Unspecified Engineering 	
APPENDIX 35		
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7

Q3

[TRUE/FALSE] NCEES policy allows the use of any scientific calculator as long as it does not have a QWERTY keyboard.

- A. TRUE
- B. FALSE

8

A3

• **B. FALSE**

You are allowed to bring one NCEES-approved calculator into the testing room. You may store spare calculators and covers with your personal belongings. To review the list of approved calculators, visit [ncees.org/exams/calculator](https://www.ncees.org/exams/calculator).



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COMPUTER-BASED EXAMS (CBT) 2		
<ul style="list-style-type: none"> Fundamentals of Engineering (FE) Fundamentals of Surveying (FS) Principles and Practice of Engineering (PE) Principles and Practice of Engineering (PE) - Electrical Environmental Fire Protection Geotechnical Systems Mechanical (all industries) Water Professional 		
PENCIL-AND-PAPER EXAMS 20		
<p>Click here for important information about changes to the October 2020 pencil-and-paper exam administration.</p>		
<ul style="list-style-type: none"> Principles and Practice of Engineering (PE) Agricultural and Biological Engineering Architectural Engineering Civil (all disciplines) Control Systems Electrical and Computer Computer Engineering Electrical and Computer Electronics, Controls, and Communications Estimating and Computer Aided 	<ul style="list-style-type: none"> PE (continued) Manufacturing and Materials Mining and Metallurgical Engineering Nuclear Architecture and Marine Engineering Other Unspecified Engineering 	
APPENDIX 35		
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Calculator policy

To protect the integrity of its exams, NCEES limits the types of calculators examinees may bring to exam sites. The list of approved calculators is reviewed annually.

The following calculator models are the only ones acceptable for use during the 2021 exams:

- **Casio:** All fx-115 and fx-991 models (Any Casio calculator must have "fx-115" or "fx-991" in its model name.)
- **Hewlett Packard:** The HP 33s and HP 35s models, but no others
- **Texas Instruments:** All TI-30X and TI-36X models (Any Texas Instruments calculator must have "TI-30X" or "TI-36X" in its model name.)

9

Q4

[TRUE/FALSE] Eligibility for taking the FE Exam is determined by whether the student is within two long semesters of graduation.

- A. TRUE
- B. FALSE

10

A4

- A. TRUE

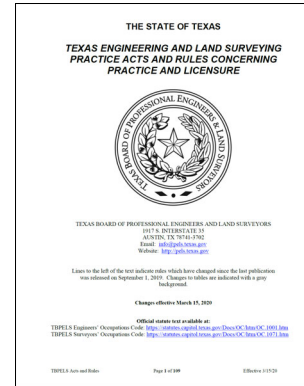
Eligibility

Eligibility to sit for an NCEES exam varies and is determined by each licensing board. It is your responsibility to review your licensing board's requirements at ncees.org/boards before registering for an exam.

§133.65 EXAMINATION ON THE FUNDAMENTALS OF ENGINEERING

(a) An undergraduate student who is within two regular semesters (not including summer sessions) of graduating may take the examination on the fundamentals of engineering provided that the student is enrolled in a degree program which is:

- (1) an engineering program accredited or approved by the EAC/ABET;
- (2) a four year baccalaureate technical program accredited or approved by the ETAC/ABET;
- (3) an engineering-related science program of four years or more that has been approved by the board; or
- (4) a non-engineering related curriculum or other degree in which the student has provided evidence acceptable to the executive director as meeting the minimum requirements of §1001.302(a)(1)(A) or (B) of the Act.



11

Q5

[TRUE/FALSE] The FE Exam uses both metric system (SI) and U.S. Customary System (USCS) units.

- A. TRUE
- B. FALSE

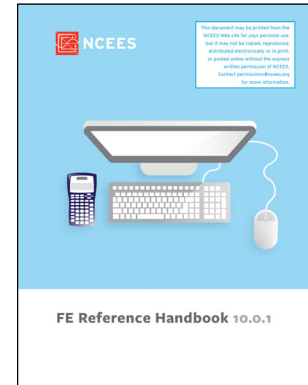
12

A5

- A. TRUE
 - SEE UNITS
 - P 1

Units and Conversion Factors**Distinguishing pound-force from pound-mass**

The FE exam and this handbook use both the metric system of units and the U.S. Customary System (USCS). In the USCS system of units, both force and mass are called pounds. Therefore, one must distinguish the pound-force (lbf) from the pound-mass (lbm).

**Use of SI Units on the FE Exam**

Metric, or SI, units are used in virtually all subjects, except some civil engineering and surveying subjects that typically use only customary U.S. (i.e., English) units. Some of the

13

Q6

The topic that constitutes the largest percentage of questions on the CIVIL CBT FE Exam is:

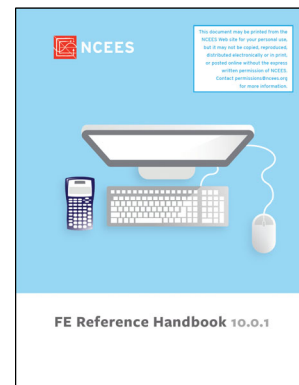
- A. Mathematics and Statistics
- B. Mechanics of Materials
- C. Structural Engineering
- D. Transportation Engineering

14

A6

- C. Structural Engineering
 - SEE CBT EXAM SPEC
 - PP476-478
 - See also Water Resources/Environmental and Geotechnical

11. **Structural Engineering** 10-15
- A. Analysis of statically determinant beams, columns, trusses, and frames
 - B. Deflection of statically determinant beams, trusses, and frames
 - C. Column analysis (e.g., buckling, boundary conditions)
 - D. Structural determinacy and stability analysis of beams, trusses, and frames
 - E. Elementary statically indeterminate structures
 - F. Loads, load combinations, and load paths (e.g., dead, live, lateral, influence lines and moving loads, tributary areas)
 - G. Design of steel components (e.g., codes and design philosophies, beams, columns, tension members, connections)
 - H. Design of reinforced concrete components (e.g., codes and design philosophies, beams, columns)



15

Q7

One of the CIVIL CBT FE Exam topics that Texas Tech CE students will **NOT**** have had as a required course in their CE curriculum is:**

- A. Probability and Statistics
- B. Materials
- C. Thermodynamics
- D. Construction Engineering

16

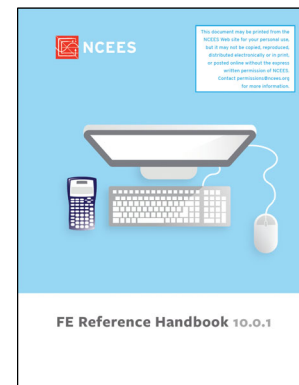
A7

- D. Construction Engineering
 - SEE CBT EXAM SPEC
 - PP267-270

14. Construction Engineering

- A. Project administration (e.g., documents, management, procurement, project delivery methods)
- B. Construction operations and methods (e.g., safety, equipment, productivity analysis, temporary erosion control)
- C. Project controls (e.g., earned value, scheduling, allocation of resources, activity relationships)
- D. Construction estimating
- E. Interpretation of engineering drawings

8–12



17

Q8

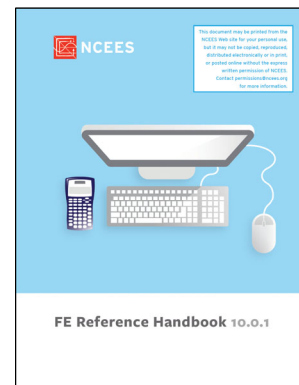
[TRUE/FALSE] The NCEES *Reference Handbook* conveniently groups all reference material for “general” engineering topics on the CIVIL CBT FE Exam to correspond directly to each of these exam topics.

- A. TRUE
- B. FALSE

18

A8

- B. FALSE
 - COMPARE TABLE OF CONTENTS TO EXAM SPECIFICATION
 - BETTER THAN IN PREVIOUS VERSIONS
 - “GENERAL” TOPICS ARE COVERED
 - NOT IN ORDER



19

Q9

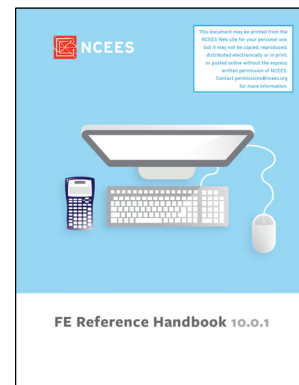
[TRUE/FALSE] The reference material needed for the CIVIL CBT FE Exam, presented on pages 259-309 of the *Reference Handbook*, contains all the information you need for CIVIL discipline-specific topics.

- A. TRUE
- B. FALSE

20

A9

- B. FALSE
 - COMPARE CONTENTS TO EXAM SPECIFICATION
 - MOST “CE” TOPICS ARE COVERED (BUT NOT IN ORDER)
 - SURVEYING IS EMBEDDED WITHIN TRANSPORTATION
 - ENVIRONMENTAL ENGINEERING IS ITS OWN CHAPTER
 - YOU’LL HAVE TO DO SOME HUNTING AROUND



21

Q10

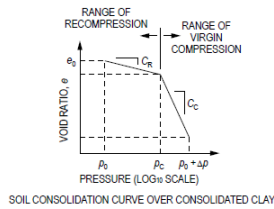
[TRUE/FALSE] The nomenclature and symbols presented in the *FE Reference Handbook* for all Civil Engineering topics of the FE Exam will always match the nomenclature and symbols presented in your coursework and textbooks at Texas Tech University.

- A. TRUE
- B. FALSE

22

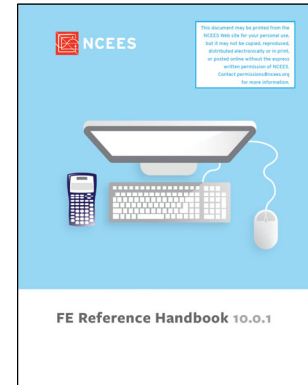
A10

- B. FALSE
– EXAMPLE FROM GEOTECH



where

- e_0 = initial void ratio (prior to consolidation)
- Δe = change in void ratio
- p_0 = initial effective consolidation stress σ'_0
- p_c = past maximum consolidation stress σ'_c
- Δp = induced change in consolidation stress at center of consolidating stratum
- $\Delta p = I q_z$



23

Q11

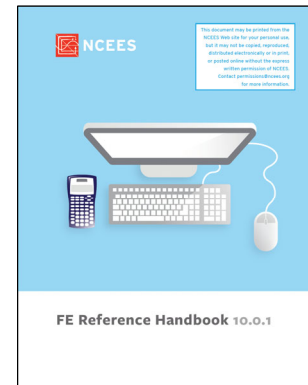
[TRUE/FALSE] It is fair to say that the *FE Reference Handbook* for the FE Exam is like a 3x5 formula card that one of your professors might allow you to use on an exam in an engineering course.

- A. TRUE
- B. FALSE

24

A11

- A. TRUE
 - CAREFULLY REVIEW THE REFERENCE HANDBOOK.
 - SEE WHAT YOU THINK...



25

Q12

[TRUE/FALSE] The recommended strategy for TTU students is to take the FE Exam *as soon as you are eligible*, and keep taking until you pass.

- A. TRUE
- B. FALSE

26

A12

• B. FALSE

– **TAKING EARLY IS A BAD IDEA...**

- STUDENTS DO BETTER WHEN THEY TEST OVER TOPICS THEY KNOW
- THE FE EXAM ONLY HAS 14 TOPICS NOW (NO FLUFF)
- TAKING EARLY USUALLY MEANS YOU HAVEN'T HAD COURSES (TRANSP0, STR DESIGN, DYNAMICS, ETC.)
- COMPARE PASS RATES FOR FIRST TIME TAKERS VS. 2ND, 3RD OR 4TH TIME TAKERS

JAN-JUN 2021 FE PASS RATES		
Exam	Volume	Pass rate
FE Chemical	701	74%
FE Civil	6049	70%
FE Electrical and Computer	1189	72%
FE Environmental	780	79%
FE Industrial and Systems	254	67%
FE Mechanical	3632	75%
FE Other Disciplines	910	63%

27

Q13

[TRUE/FALSE] The PPI *FE CIVIL Review Manual* is conveniently organized such that the order of topics in is exactly the same as for the NCEES CIVIL CBT Exam Specification and the *FE Supplied Reference Handbook*.

- A. TRUE
- B. FALSE

28

A13

- B. FALSE
 - COMPARE TABLE OF CONTENTS
 - “CLOSE” TO FE SPECIFICATION, BUT NOT EXACTLY
 - TOPIC COVERAGE IN MANUAL IS VARIABLE
 - ENVIRONMENTAL IS ITS OWN CHAPTER
 - SURVEYING COMBINED WITH TRANSPORTATION
 - NOT IN EXACT SAME ORDER



29

Q14

According to the “How You Can Use this Book” section of the *FE Review Manual*, the book is written such that you should be able to review a typical chapter in:

- A. 30 minutes or so
- B. One hour or so
- C. Two hours or so
- D. Four hours or so

30

A14

- B. ONE HOUR OR SO...

You need to decide on a study schedule. I separated the subjects and chose the quantity of problems in this book so that you can easily review a chapter a day in an hour or so—even if you are taking a review course with other homework.



31

Q15

[TRUE/FALSE] According to the “About this Book” section of the *FE Review Manual*, the *FE Review Manual* is not intended as a reference book.

- A. TRUE
- B. FALSE

32

A15

- A. TRUE

This book is not intended as a reference book, because you cannot use it in the examination. On the other hand, the NCEES Handbook is not suitable for use as a study aid. You certainly need to become familiar with its format, layout, and organization, however. This book, which follows the NCEES Handbook's subject sequence, satisfies your two needs: to become familiar with the NCEES Handbook and to study from something better.



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FE Exam Knowledge

33

33

Q16

[TRUE/FALSE] According to the “How You Can Use this Book” section of the *FE Review Manual*, you should study every subject in the book.

- A. TRUE
- B. FALSE

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FE Exam Knowledge

34

34

A16

- A. TRUE

Work Through Everything

NCEES has greatly reduced the number of subjects about which you are expected to be knowledgeable and has made nothing optional. Skipping your weakest subjects is no longer a viable preparation strategy. You should study all examination knowledge areas, not just your specialty areas. That means you study every chapter in this book and skip nothing. Do not limit the number of chapters you study in hopes of finding enough questions in your areas of expertise to pass the exam.



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35

35

Q17

[TRUE/FALSE] According to the “About the Exam” section of the *FE Review Manual*, some of the exam question statements contain superfluous/ confusing information.

- A. TRUE
- B. FALSE

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36

36

A17

- A. TRUE

DO QUESTION STATEMENTS INCLUDE SUPERFLUOUS INFORMATION?

Particularly since all relevant information is provided in the question statements, some questions end up being pretty straightforward. In order to obfuscate the solution method, some irrelevant, superfluous information will be provided in the question statement. For example, when finding the applied force from a given mass and acceleration (i.e., $F = ma$), the temperature and viscosity of the surrounding air might be given. However, if you understand the concept, this practice will be transparent to you.



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37

37

Q18

[TRUE/FALSE] According to the “About the Exam” section of the *FE Review Manual*, to facilitate score reliability, NCEES changes the FE Exam questions so that each exam contains a different yet specific “set” of equivalent exam questions.

- A. TRUE
- B. FALSE

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38

38

A18

- A. TRUE

YOUR EXAM IS UNIQUE

The exam that you take will not be the exam taken by the person sitting next to you. Differences between exams go beyond mere sequencing differences. NCEES says that the CBT system will randomly select different, but equivalent, questions from its database for each examinee using a linear-on-the-fly (LOFT) algorithm. Each examinee will have a unique exam of equivalent difficulty. That translates into each examinee having a slightly different minimum passing score.



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FE Exam Knowledge

39

39

Q19

[TRUE/FALSE] According to the “Engineering Registration in the United States” section of the *FE Review Manual*, the FE Exam is not graded on a curve.

- A. TRUE
- B. FALSE

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FE Exam Knowledge

40

40

A19

- A. TRUE

Grading and Scoring the FE Exam

The FE exam is not graded on a curve, and there is no guarantee that a certain percent of examinees will pass. Rather, NCEES uses a modification of the Angoff procedure to determine the suggested passing score (the cutoff point or cut score).



41

Q20

According to the “About the Exam” section of the *FE Review Manual*, a passing score on the FE Exam equates to working the following “raw” percentage of problems correctly:

- A. Somewhat less than 30 percent
- B. Somewhat less than 40 percent
- C. Somewhat less than 50 percent
- D. Somewhat less than 60 percent

42

A20

- C. Hovering around 50 percent

In the past, NCEES has rarely announced a minimum required passing score for the FE exam, ostensibly because the average score changed slightly with each administration of the exam. However, inside information reports that the raw percentage of questions that must be answered correctly was low—hovering around 50%. NCEES intends to release performance data on the CBT examinations approximately quarterly. That



43

Q21

[TRUE/FALSE] According to the “About the Exam” section of the *FE Review Manual*, your “raw” percent correct FE Exam score will probably be scaled such that 70 is identified as a passing score.

- A. TRUE
- B. FALSE

44

A21

- A. TRUE

Since each state requires a passing score of 70, NCEES simply scales 50% (or whatever percentage the minimum required passing score represents) up to 70. Everyone seems happy with this practice—one of the few times that you can get something for nothing.



45

Q22

[TRUE/FALSE] According to the “About the Exam” section of the *FE Review Manual*, you should always take the phrase “most nearly” to mean the answer option that is most nearly what you calculated, regardless of whether it is more or less than your calculated value.

- A. TRUE
- B. FALSE

46

A22

- B. FALSE

What Does *Most Nearly Really* Mean?

One of the more disquieting aspects of these questions is that the available answer choices are seldom exact. Answer choices generally have only two or three significant digits. Exam questions instruct you to complete the sentence, "The value is most nearly...", or they ask "Which answer choice is closest to the correct value?" A lot of self-confidence is required to move on to the next question when you don't find an exact match for the answer you calculated, or if you have had to split the difference because no available answer choice is close.



47

Q23

[TRUE/FALSE] According to the "How You Can Use this Book" section of the *FE Review Manual*, the most successful strategy to pass the FE Exam is to prepare in all the examination subjects. Do not limit the number of subjects you study.

- A. TRUE
- B. FALSE

48

A23

- A. TRUE

Work Through Everything

NCEES has greatly reduced the number of subjects about which you are expected to be knowledgeable and has made nothing optional. Skipping your weakest subjects is no longer a viable preparation strategy. You should study all examination knowledge areas, not just your specialty areas. That means you study every chapter in this book and skip nothing. Do not limit the number of chapters you study in hopes of finding enough questions in your areas of expertise to pass the exam.



49

Q24

[TRUE/FALSE] According to the “Strategies for Passing the Exam” section of the *FE Review Manual*, “a good prior night’s sleep” is the best way to start the examination.

- A. TRUE
- B. FALSE

50

A24

- A. TRUE

The Day Before the Exam

Take the day before the examination off from work to relax. Do not cram the last night. A good prior night's sleep is the best way to start the examination. If you live far from the examination site, consider getting a hotel room in which to spend the night.

Make sure your exam kits are packed and ready to go.

