WHAT ABOUT CALCULATORS?

The exam requires use of a scientific calculator. However, it may not be obvious that you should bring a graphing calculator with you to the examination. It is always unfortunate when an examinee is not able to finish because his or her calculator was dropped or stolen or stopped working for some unknown reason.

The exam has not been optimized for any particular brand or type of calculator. In fact, for most calculations, a $15 scientific calculator will produce results as satisfactory as those from a $200 calculator. There are definite benefits to having built-in statistical functions, graphing, unit-conversion, and equation-solving capabilities. However, these benefits are not so great as to give anyone an unfair advantage.

It is essential that a calculator used for the civil PE examination have the following functions:

- trigonometric and inverse trigonometric functions
- hyperbolic and inverse hyperbolic functions
- pi
- sqrt and x^2
- logarithms and natural logarithms
- e^x and e^x
- For maximum speed and utility, your calculator should also have or be programmable for the following functions:
  - interpolation
  - finding standard deviations and variances
  - extracting roots of quadratic and higher-order equations
  - calculating determinants of matrices
  - linear regression
  - calculating factors for economic analysis questions

You may not share calculators with other examinees.

Be sure to take your calculator with you whenever you leave the examination room for any length of time.

HOW IS THE EXAM GRADED AND SCORED?

The maximum number of points you can earn on the civil engineering PE exam is 80. The minimum number of points for passing (referred to by NCES as the "passing score") varies from exam to exam. The cut score is determined through a rational procedure, without the benefit of knowing examinees' performance on the exam. That is, the exam is not graded on a curve. The cut score is selected based on the number of examinees you are expected to know, not based on passing a certain percentage of engineers.

Each of the questions is worth one point. Grading is straightforward, since a computer grades your score sheet. Either you get the question right or you don't. That's it. There is no deduction for incorrect answers, so guessing is encouraged. However, you must work two or more answers for the same problem, no credit is given for probability.

You will receive the results of your examination from your state board (not NCES) by mail. Allow three to four months for notification. Your score may or may not be available to you, depending on your state's procedures. Even when the score is reported to you, it may have been sealed or normalized to 100%. WHAT YOU SHOULD KNOW

NCES releases defective copying exams. As a result, there is not necessarily the placement of correct responses. Therefore, it is most likely that you will guess all "A", "B", "C", or "D."

The proper way to guess as an engineer should use your knowledge of the subject to eliminate illogical answer choices. Illogical answer choices are those that violate good engineering principles, that are outside normal operating ranges, that require extraordinary assumptions. Of course, this requires you to have a basic understanding of the subject in the first place. Otherwise, it's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

You won't get any points using the "test-taking skills" that helped you in college—the skills that helped you with tests prepared for, or if you mark two or more answer choices from the same group. It's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

You won't get any points using the "test-taking skills" that helped you in college—the skills that helped you with tests prepared for, or if you mark two or more answer choices from the same group. It's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

You won't get any points using the "test-taking skills" that helped you in college—the skills that helped you with tests prepared for, or if you mark two or more answer choices from the same group. It's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

You won't get any points using the "test-taking skills" that helped you in college—the skills that helped you with tests prepared for, or if you mark two or more answer choices from the same group. It's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

You won't get any points using the "test-taking skills" that helped you in college—the skills that helped you with tests prepared for, or if you mark two or more answer choices from the same group. It's back to the guessing process. That's the reason that the minimum passing score is higher than 25%.

NCES regularly poses good problems that have appeared on previous exams. Therefore, examination integrity is a serious issue with NCES, which goes to great lengths to make sure nobody copies the questions. You may not keep, distribute, or discuss questions of interest to another person, or copy questions into your calculator, or copy problems into your own material.

The proctors are concerned about exam subversion, which generally means activity that might invalidate the examination or the exam-taking process. The most common form of exam subversion involves trying to copy exam problems for future use.

NCES has become increasingly unforgiving about loss of its intellectual property. NCES routinely prosecutes violators and seeks financial redress for loss of its examination problems, as well as invalidating any engineering license you may have earned by taking one of its examinations while engaging in prohibited activities. Your state board may impose additional restrictions on your right to sit for or retake civil engineering exams, or may impose other, more severe punishments on any such activities. In addition to tracking down the sources of any examination problem compilations that it becomes aware of, NCES is also aggressively pursuing and prosecuting examinees who disclose the contents of the exam in Internet forums or "chat" environments. Your constitutional rights to free speech and expression will not protect you from civil prosecution for violating the nondisclosure agreement that NCES requires you to sign before taking the examination. If you wish to participate in a dialog about a particular exam subject, you must do so in such a manner that does not violate the essence of your nondisclosure agreement. This requires you not to decouple your discussion from the examination and refraining the question to avoid any examination particulars.

PART 3: HOW TO PREPARE FOR AND PASS THE PE EXAM IN CIVIL ENGINEERING

WHAT SHOULD YOU STUDY?

The exam covers many diverse subjects. Strictly speaking, you don't have to study every subject on the exam in order to pass. However, the more subjects you study, the more you'll improve your chances of passing. You should decide early in the preparation process which subjects you are going to study. The strategy you select will depend on your background. Following are the four most common strategies.

A broad approach is the key to success for examinees who have recently completed their academic studies. This strategy is most effective for those with a relatively small amount of undergraduate subjects (which means studying all or most of the chapters in this book). The examination includes enough fundamental material to pass this strategy worthwhile. Overall, it's the best approach.
that you need. You can speed up your problem-solving response time significantly if you don’t have to look up the conversion factors from gpd/in to ft^3/sec, the definition of the sine of an angle, and the chemical formulas for carbon dioxide, but you don’t even have to memorize these kinds of things. As you work practice problems in your companion book, you will automatically memorize the things that you come across more than a few times.

DO YOU NEED A REVIEW SCHEDULE?

It is important that you develop and adhere to a review outline and schedule. Once you have decided which subjects you are going to study, you can allocate the available time to those subjects in a manner that makes sense to you. If you are not taking a classroom review course (where the order of information is determined by the lecturer), you should make an outline of subjects for self-study use for scheduling your preparation. A fill-in-the-blank schedule is provided in Table 4 at the end of this Introduction. If you purchased this book directly from PPI, you will also have access to an interactive, adjustable, and personalized study schedule. Log on to your PPI account to access your custom study schedule.

A SIMPLE PLANNING SUGGESTION

Designate some location (a drawer, a corner, a carded box, or even a paper shopping bag left on the floor) so your “exam catch-all” or “used for catch-all” is used by catch-all day before the exam when you have revolutions. For example, you might record that the plastic ruler marked off in inches is so that it is normally kept in the kitchen sink drawer can help you with some cold-press questions. Or, you might decide that a certain book is particularly valuable. Or, that it would be nice to have when you need to look up something. On, that large rubber bands and clips are useful for holding books open.

It isn’t actually necessary to put these treasured items in the catch-all drawer before your preparation. You can, of course, if it’s convenient. But if these items will have other functions during the time before the exam, at least write you a note and put the note into the catch-all drawer. When you go to pack your exam kit a few days before the exam, you can transfer some items immediately, and the notes will be ready for the other items that are back in the kitchen drawer.

HOW YOU CAN MAKE YOUR REVIEW REALISTIC

In the exam, you must be able to quickly recall solution procedures, formulas, and important data. You must remain sharp for eight hours or more. When you played a sport back in school, your coach tried to put you in game-related situations. Preparing for the PE exam isn’t much different from preparing for a big game.

Some part of your preparation should be realistic and representative of the examination environment.

There are several things you can do to make your review more realistic. For example, if you gather most of your review resources (including books) in advance and try to use them exclusively during your review, you will become more familiar with them. (Of course, you can also add to or change your references if you find inadequacies.)

Learning to use your time wisely is one of the most important lessons you can learn during your review. You will undoubtedly encounter times when you do not expect. In some instances, you will cause your own delays by spending too much time looking through books for things you need (or just by looking for the books themselves). Other times, theعائلات will entail too much work. Learn to recognize these situations so that you can make an intelligent decision about skipping such questions in the exam.

WHAT TO DO A FEW DAYS BEFORE THE EXAM

There are a few things you should do a week or so before the examination. You should arrange for childcare and transportation. Since the examination does not always start or end at the designated time, make sure that your childcare and transportation arrangements are flexible. Check PPI’s website for last-minute updates and errata to any PPI books you might have and are bringing to the exam.

Obtain a separate copy of this book’s index. You may be able to photocopy the actual index, alternatively, you may find the index as a downloadable PDF on PPI’s website.

If you haven’t already done so, read the "Advice from Examiner" section of PPI’s website.

If you haven’t been following along on the Engineering Exam Forum on PPI’s website, use the search function to locate relevant discussions.

If it’s convenient, visit the exam location in order to find the building, parking, and exam facilities. Review the examination, and if it’s not convenient, you may find driving directions and/or site maps on the web.

Take the battery cover off your calculator and check to make sure you are bringing the correct size replacement batteries. Some calculators require a different kind of battery for their “permanent” memories. Put the cover back on and secure it with a piece of masking tape. Write your name on a piece of tape to identify your calculator.

If your spare calculator is not the same as your primary calculator, turn a few minutes familiarizing yourself with how it works. In particular, you should verify that your spare calculator is functional.

PREPARE YOUR EXAM KITS

Second in importance to your scholastic preparation is the preparation of your two examination kits. The first kit consists of a bag, box (plastic milk crates hold up better than cardboard in the min), or wadded travel suitcase containing items to be brought with you into the examination room.

The second kit consists of the following items and should be left in a separate bag or box in your car in case they are needed.

- spare calculator
- instruction booklet for your calculator
- extra calculator batteries
- straightedge and rulers
- compass
- protractor
- scissors
- stapler
- transparent tape
- magnifying glass
- small (jeweler’s) screwdriver for fixing your glasses
- or for removing batteries from your calculator
- nonabrasive (quiet) masks or earplugs, already unwrapped
- two small plastic bottles of water
- travel pack of tissue (keep in your pocket)
- handkerchief
- headache remedy
- personal medication
- $5.00 in miscellaneous change
- back-up reading glasses
- light, comfortable sweater
- loose shoes or slippers
- cushion for your chair
- earplugs
- wristwatch with alarm
- several large trash bags (“raincoats” for your boxes of books)
- roll of paper towels
- wire coat hanger (“to hang up your jacket or to get back into your car in an emergency”)
- extra set of car keys on a string around your neck

The second kit consists of the following items and should be left in a separate bag or box in your car in case they are needed.

- copy of your application
- proof of delivery
- light lunch
- beverage in thermos or case
- snack from the area
- extra pair of prescription glasses
- raincoat, boots, gloves, hat, and umbrellas
- street map of the examination area
- parking permit
- battery-powered desk lamp
- your cell phone
- piece of rope

The following items cannot be used during the examination and should be left at home.

- personal pencils or erasers (NCEES distributes mechanical pencils at the exam.)
- fountain pen
- radio or tape/CD player
PREPARATION FOR THE EXAM

All of the occurrences listed in this section have happened to examiners. Granted, you cannot prepare for every eventuality. But, even though each of these occurrences happens individually in a low-probability event, taken together, they are worth considering in advance.

- Imagine getting a flat tire, getting stuck in traffic, or running out of gas on the way to the exam.
- Imagine rain and snow as you are carrying your cardboard box of books into the exam room. Would plastic trash bags be helpful?
- Imagine arriving late. Can you get into the exam without having to make two trips from your car?
- Imagine having to park two blocks from the exam site. How are you going to get everything to the exam site? Can you actually carry everything that fits? Could you use a furniture dolly, a supermarket dolly, or perhaps a handtruck?
- Imagine a Star Trek convention, square-dancing contest, construction, or auction in the next room.
- Imagine a site without a bus, with poor lighting, or with sunlight streaming directly into your eyes.
- Imagine a hard folding chair and a table with one short leg.
- Imagine a site next to an airport with frequent takeoffs, or next to a construction site with a pile driver, or next to the NIH’s Drag Racing Championship.
- Imagine a seat where someone nearby chews gum with an open mouth, taps his pencil or drums his fingers, or whistles, coughs, and sneezes for eight hours.
- Imagine the distraction of someone crying or of people yawning and screaming examiners who have been found or heard, or hearing the tragedy of another examinee’s serious medical emergency.
- Imagine a delay of an hour while they find someone to unlock the building, turn on the heat, or wait for the head proctor to bring instructions.
- Imagine a power outage occurring sometime during the exam.
- Imagine a proctor who (a) tells you that one of your favorite books can’t be used in the exam, (b) picks up, or (c) calls “time up” without giving you any warning.
- Imagine not being able to get your lunch out of your car or find a restaurant.

WHAT TO DO THE DAY BEFORE THE EXAM

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

Practice setting up your examination work environment. Carry your boxes to the kitchen table. Arrange your “bookcase” supplies. Decide what stays on the floor in boxes and what gets an “honored position” on the table.

Use your checklist to make sure you have everything.

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

Wrap your books in plastic bags in case it’s raining when you carry them from the car to the exam room.

Calculate your wake-up time and set the alarms on your two bedroom clocks. Select and lay out your clothing items. (Dress in layers.) Select and lay out your breakfast items.

If it’s going to be hot on exam day, put your (plastic) bottles of water in the freezer.

Make sure you have gas in your car and money in your wallet.

WHAT TO DO THE DAY OF THE EXAM

Turn off the hourly and quarterly alerts on your wristwatch. Leave your pager or cell phone at home. If you must bring them, change them to silent mode. Bring or buy a morning newspaper.

You should arrive at least 30 minutes before the examination starts. This will allow time for finding a convenient parking place, bringing your materials to the examination room, making room and settling chairs, and calming down. Be prepared, though, to find that the examination room is not open or ready by the designated time.

Once you have arranged the materials around you on your table, take out your morning newspaper and book. (Only nervous people work crossword puzzles.)

WHAT TO DO DURING THE EXAM

All of the procedures typically associated with timed, proctored, computer-scored assessment tests will be in effect when you take the PE examination.

The proctors will distribute the examination booklets and answer sheets if they are not already on your table. However, you should not open the booklets until instructed to do so. You may read the information on

the front and back covers, and you should write your name in the appropriate blank spaces.

Listen carefully to everything the proctors say. Do not ask your proctors any engineering questions. Even if they are knowledgeable in engineering, they will not be permitted to answer your questions.

Answers to questions are recorded on an answer sheet contained in the test booklet. The proctors will guide you through the process of putting your answers and other biographical information on this sheet when the time comes, which will take approximately 15 minutes. You will be given the full four hours to answer questions.

Time to initialize the answer sheet is not part of your four hours.

The common suggestions to "completely fill the bubbles and erase completely" apply here. NCEEES provides each examinee with a mechanical pencil with HB lead. Use of ballpoint pens and felt-tip markers is prohibited for several reasons.

If you finish the exam early and there are still more than 30 minutes remaining, you will be permitted to leave the room. If you finish less than 30 minutes before the end of the exam, you may be required to remain until the end.

This is done to be considerate of the people who are still working.

When you leave, you must return your exam booklet. You may not keep the exam booklet for later review.

If there are any questions that you think were flawed, in error, or unsolvable, ask a proctor for a "reporting form" on which you can submit your comments. Follow your proctor’s advice in preparing this document.

WHAT ABOUT EATING AND DRINKING IN THE EXAM ROOM?

The official rule is probably the same in every state: no eating or drinking in the exam. That makes sense, for a number of reasons. Some exam sites don’t want (or don’t permit) snacks and beverages. Others don’t want crumbs to attract ants and rodents. Your table partners don’t want spit or food crumbs. Nobody wants the distractions. Your proctors can’t give you a new exam booklet when the first one is ruined with coffee.

How this rule is administered varies from site to site and from proctor to proctor. Some proctors enforce the letter of the law, threatening to eject you from the exam room when they see you chewing gum. Others may permit you to have bottled water, as long as you store the bottle on the floor where any spills will not harm what’s on the table. No one is going to let you drink peanuts while you work on the exam. If you are one of those people complaining about a hard candy melting away in your mouth, you’ll just have to find out when you get there.

SOLVE QUESTIONS CAREFULLY

Many points are lost to carelessness. Keep the following items in mind when you are solving the end-of-chapter questions. Hopefully, these suggestions will be automatic in the exam.

- Did you check your mathematical equations?
- Did the units cancel out in your calculation?
- Did you convert between radians and degrees?
- Did you convert between feet and inches?
- Did you convert from gage to absolute pressure?
- Did you convert between kPa and Pa?
- Did you check all data obtained from other sources, tables, and figures? (In finding the friction factor, did you enter the Moody diagram at the correct Reynolds number?)

DO YOU TALK TO OTHER EXAMINEES AFTER THE EXAM?

The jury is out on this question. People react quite differently to the examination experience. Some people are energized. Most are exhausted. Some need people to unwind by talking with other examinees, describing every detail of their experience, and dissecting every examination question. Others need lots of quiet space, and prefer to just get into a hot tub and soak and talk. Most engineers, apparently, are in this latter category.