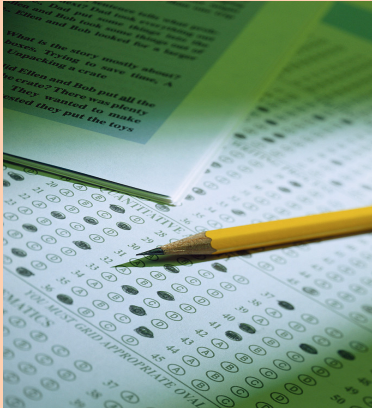


Fundamentals of Engineering Exam

Fall 2013

Frank H. Dotterweich College of Engineering

Where will I take the FE Exam?



When you sign up for the FE exam, you will request a testing site. Your paperwork confirming your registration should give you details of when and where you will take your exam. We are offering the FE exam on

campus for a limited number of students. Details are as follows:

- Saturday, October 26th
- Engineering Complex , Room 109
- Testing begins at 8:00 am, but show up by 7:15 am!

Dr. A. Pilhevari and an observer from NCEES will proctor the exam. Remember that the observer will be reporting back to NCEES on any suspicious behavior.

Be sure to read your candidate agreement carefully. There is strict control over personal items permitted in the room, identification, and calculators.

What's NCEES?

- NCEES = National Council of Examiners for Engineering and Surveying.
- National non-profit organization that *writes* and *oversees* the FE exam.
- The exam is offered locally but administered nationally!

Get started:

<http://www.ncees.org>

Don't miss our TBPE guest speaker!

Mr. David Howell, P.E., will speak on professional licensure in room 109 of the Engineering Complex on Thursday, September 19th. He will present twice, once from 12:30-1:30 pm and again from 4:00-5:00 pm.

Mr. Howell is the Director of Licensing for the Texas Board of Professional Engineers.

Mr. Howell will discuss the process for becoming a professionally licensed engineer in the State of Texas. He will also specifically address the FE exam. This is an excellent opportunity for you to learn whether professional licensure should be a career goal for you and how to make that goal a reality. Make plans to attend!

Can I use my calculator?

NCEES permits **only** the following calculator models:

- All Casio fx-115 models.
- Hewlett Packard HP 33s and HP 35s.
- Texas Instruments TI – 30X and TI-36X models.

Remember to practice with your calculator before you take the FE to ensure best performance and reduce stress anxiety! For more information, go to:

<http://ncees.org/exams/calculator-policy>

Time for a Pop Quiz!

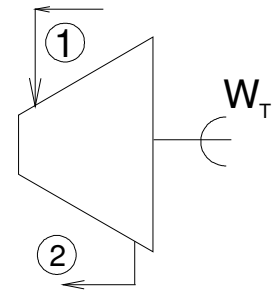
The following basic content questions were submitted by College of Engineering faculty to give you an opportunity to quiz yourself. You will find the answers to the quiz on page 4. To give you an even better idea of how you're performing, try answering in only 2 minutes per question (roughly the speed needed to complete morning questions).

THERMODYNAMICS

These problems have multiple parts. Give yourself extra time.

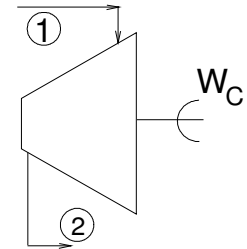
(1) The real (not ideal) **turbine** on the right takes superheated steam at T_1 and P_1 and discharges wet steam at P_2 . If its efficiency is **increased** without changing T_1 , P_1 , or P_2 :

- A) Does T_2 increase, decrease, or stay the same?
- B) Does $|W_T|$, the absolute value of the work, increase, decrease, or stay the same?
- C) Does x_2 increase, decrease, or stay the same?
- D) Does H_2 increase, decrease, or stay the same?
- E) Does S_2 increase, decrease, or stay the same?



(2) The machine on the right is a real (not ideal) **gas compressor** operating at P_1 , T_1 , and P_2 . If its efficiency is **increased** without changing T_1 , P_1 , or P_2 :

- A) Does T_2 increase, decrease, or stay the same?
- B) Does $|W_c|$, the absolute value of the work, increase, decrease, or stay the same?
- C) Does H_2 increase, decrease, or stay the same?
- D) Does S_2 increase, decrease, or stay the same?



ETHICS

(3) Select the answer that best completes this sentence. Professional engineers are ethically required to:

- A) Do what is best for their engineering society.
- B) Take full responsibility to do their work.
- C) Advance their careers with high standard of practice.
- D) Perform their engineering service without conflicts of interest.

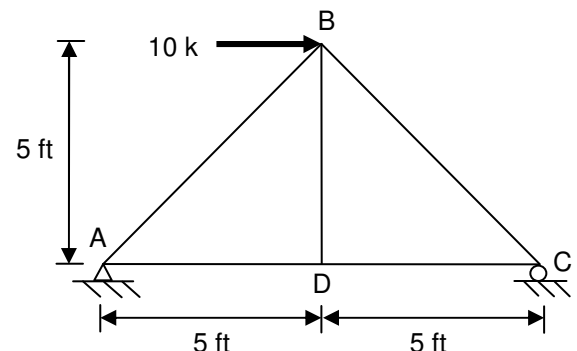
(4) Which of the following characteristics designate engineering as a profession rather than an occupation?

- A) Engineering requires special knowledge.
- B) Engineers have special privileges.
- C) Engineering is self-regulating.
- D) Engineers have special responsibilities.
- E) All of the above.

STATICS

(5) For the truss at right, what is the axial force in member BD?

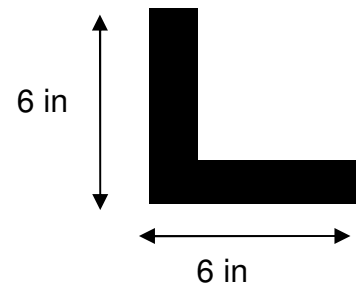
- A) 10 kips in compression
- B) 7 kips in tension
- C) 7 kips in compression
- D) 0 kips





(6) An L-shaped cross-section (at right) is made of two 6 in by 1 in rectangles. What is the centroid of this cross-section, as measured from the lower left corner of the shape?

- A) (3.0, 3.0) inches
- B) (2.4, 3.0) inches
- C) (1.9, 1.9) inches
- D) (1.9, 3.4) inches



ENGINEERING ECONOMICS

(7) A local store sells a 60" Full HD plasma TV for \$30 per week to be paid in 24 months. If the cash value is \$1,870 find the approximate effective interest rate per year charged on this purchase.

- A) 0 %
- B) 26 %
- C) 52 %
- D) 78 %

CIRCUITS

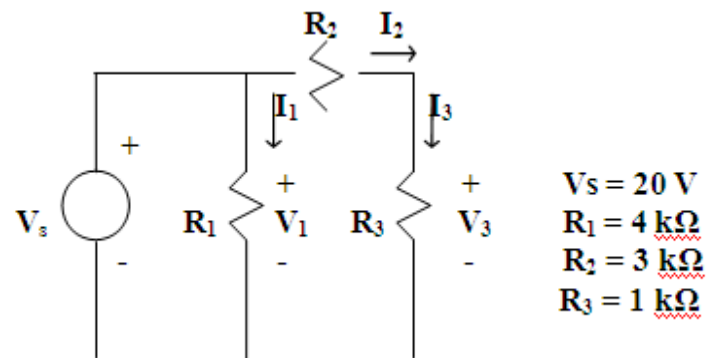
Use the circuit at right to answer questions (8) and (9).

(8) Find the current I_1 and voltage V_3 .

- A) 5 mA, 1V
- B) 5 mA, 5V
- C) 4 mA, 5V
- D) None of the above

(9) Find the power dissipated across R_2 .

- A) 75 W
- B) 75 kW
- C) 75 mW
- D) None of the above



FLUIDS

(10) Water flows in a 5-cm-diameter pipe at a velocity of 0.75 m/s. The mass flow rate of water in the pipe is:

- A) 353 kg/min
- B) 75 kg/min
- C) 37.5 kg/min
- D) 1.47 kg/min
- E) 88.4 kg/min

(11) The coefficient of compressibility of a truly incompressible substance is:

- A) 0
- B) 0.5
- C) 1
- D) 100
- E) Infinity

ACKNOWLEDGMENTS

Fluids questions from Cengel and Cimbala, *Fluid Mechanics*, 3rd edition. Thanks to Dr. Murphy, Dr. Leelani, Dr. Aguiniga, Dr. McLauchlan, and Dr. Sai for their assistance in developing this quiz!

What resources can help me prepare?

Practice, practice, practice! Nothing can better prepare you to take the FE exam than to work lots of engineering problems. Students who take the time to study together in small groups and meet at a regular time to practice tend to be more successful on the FE than students who rely on last-minute cramming. There are lots of resources to help you prepare for the FE exam.

STUFF THAT COSTS MONEY:

- Kaplan Engineering Education has several resources, including an online diagnostic test (about \$40), a complete online review course, and review books for purchase. Visit: http://www.kaplanaecengineering.com/kaplanAECEngineering/family_id%60114%60menu_id%601194%60product_list.aspx
- Testmasters offers review courses in a classroom setting. The course is expensive but discounts are offered for full-time students. See: <http://www.testmasters.com/eit-fe.html>
- EIT Exam is a website offering online access to test questions for a monthly registration fee. It is a cost-effective way to prepare. See: <http://www.eitexam.com/>
- PPI offers manuals that include brief reviews of a course plus lots of problems to work. They also offer online review courses. Visit: <http://ppi2pass.com/shop/fe-eit-exam>

STUFF YOU CAN USE FOR FREE:

- Your Texas A&M University-Kingsville faculty! Many professors are willing to hold informal review sessions with students serious about preparing for the FE.
- Faculty at Texas A&M University have videotaped a number of review sessions. These can be downloaded in MP4 format or viewed as streaming video. This resource is available for **free** at: <http://engineeringregistration.tamu.edu/tapedreviews/>
- The College of Engineering has purchased several NCEES sample question books (see below). These may be borrowed from the JESSC!

AND DON'T FORGET THE NCEES WEBSITE:

You should also spend some time getting to know the NCEES website, <http://ncees.org/exams/fe-exam/>. This website is a treasure trove of information about the FE, such as:

- Detailed outlines of topics covered in morning and afternoon exams.
- Copies of the FE reference manual you can download for free in PDF format. (Hardcopies cost \$14.)
- Sample question and answer books (cost \$35). These books contain **half** an FE exam, both morning and afternoon sessions, and are available for both discipline specific and other disciplines exams. **These may also be checked out in the JESSC!**
- More information about calculators, scoring, format, etc. Much of the resources in this newsletter have come from NCEES directly!

GOOD LUCK, JAVELINA ENGINEERS!

Did You Know...?

- (1) The FE exam is 8 hours long. The 4 hour morning session has 120 questions, and the 4 hour afternoon session has 60 questions.
- (2) There is a common morning session, but you may take the Chemical, Civil, Electrical, Environmental, Industrial, Mechanical, or Other Disciplines section in the afternoon.
- (3) Guessing doesn't hurt you! Wrong and blank answers are scored the same, so why leave any spots blank?
- (4) Because you have to move through the exam so quickly (two minutes per question in the morning and four in the afternoon), FE questions are designed to be answered quickly. Many of them cover simple conceptual information.
- (5) You will be given a copy of the FE supplied reference manual at the exam. Be sure to familiarize yourself with the reference manual so you know where equations are on exam day. And if an equation is in the reference manual, it's there for a purpose. Look it up if you don't recognize it!
- (6) Taking the FE exam just to "see how it goes" doesn't make you (or our school) look good to potential employers. There are lots of other tools, such as the resources at left, that can let you know if you are really ready. So make use of them, rather than gambling on the outcome of your exam.
- (7) Last minute cramming does more harm than good. Get a good night's sleep, eat a healthy breakfast, and show up sharp and ready to work.

Quiz Answers:

- | | |
|----------------------|--------|
| (1) a Same; b & c— | (5) D |
| Increase; d & e— | (6) C |
| Decrease. | (7) C |
| (2) a to d—Decrease. | (8) B |
| (3) B | (9) C |
| (4) E | (10) E |
| | (11) E |