How to pen a winning essay exam question

1  Why an essay exam for a science class?

Put simply: To show that you understand the material well enough to connect the dots posed in the question to get to an answer with as little divergence as possible. This is especially true for timed exams where we will assume that for a typical in-session exam (1-2 hours), you will spend a small amount of that time, actually writing (sometimes as little as half the period, if you’re on the ball). Essay exams are also training for penning your comprehensive/coursework exam, thesis, papers and proposals. Your writing skills are as important to your meal ticket as your scientific and technical skills. Indeed, they are a subset of the latter.

2  Why not plug and chug exams

They have their uses, but not for all cases. This especially true when we want to see students’ integrative skills, which are what we like to see in a graduate or upper-level class. Also see those last three sentences in the answer above.

3  What is the best way to answer one of these questions?

There is no real formula, since essay exams may be very specific in how they want to ask a question. But if you insist, here is a template that helped me.

0) *Read the original exam instructions (Page One).* This is where you see what the individual prof may want and what he or she may definitely not want. For example, I make it clear that the pithier the answer, the better the answer. Some profs may accept figures and equations with comments, others may want things explicitly identified in the exam. If no such core instructions exist, ask the prof. (For example, “Can we answer these questions in a short paragraph or a few sentences, or do you want a page or so of text?” is a very fair question before the exam starts.)

1) *Read ALL of the exam questions before beginning.* Simple strategy: know what’s ahead of you so you can pace yourself. Some answers are easier than others. You may also start to see trends in what the prof is asking and what he or she wants to see in answers.

2) *Read the specific exam questions.* This will show you where the points are going to be assigned. It may also give guidance and hints as to how to format the answer.

3) *Don’t start writing the answer to any question right away.* This is the worst thing you can do, even if you know it. Collect your thoughts and prepare a cut-to-the-chase answer. I found that the best way to do it is to formulate a “one-sentence” answer (coming up at #6).

4) *Don’t even think of providing any Bravo Sierra™ in lieu or in concert with a strong answer.* We can smell it a mile away.

5) *Also do not even think of doing a “core” dump or a data dump.* A core dump is the large file that a Linux program may write before crashing. They are not easily readable and the knowledge-to-size ratio is often very low. Data dumps are the same. A grader does not want to drown in data while dying of thirst for knowledge. Both of these strategies are as bad as or even worse than “BS”ing. *You may also forget to answer the question (this happened to me once)!*

Now enough with the don’ts and on to the do’s

6) *Compress your answer to the question into one concise sentence.* It must explicitly answer the question with no doubt, fishing or Easter Egg hunts. (Just saying F=ma won’t cut it unless they’re asking about Newton’s second law). If it takes more than one phrase, compose it into a very pithy bullet list. This does two things. It permits you to answer the question right away. It makes sure that you continue to answer the question when your pen finally meets paper. *This “one-sentence” answer is going to be your lead sentence.* It’s also going to be the skeleton on to which you will add the muscle. “One-sentencing” is an important skill that you will need to develop beyond just test taking. The common rules of oral communication say you have to catch your initial audience’s attention within the first minute or you may start to lose them (the answering machine rule shortens this 15-30 seconds).

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1 I owe a big debt to an old acquaintance, Betsy Speicher, for coining this term. For her, it was a game where you answered a complex question in a single sentence. It required you to boil things down to the extreme essentials. Being able to do this is your key survival tactic on an in-class essay exam.
“One-sentencing” will help you rope them in ASAP. The “One-Sentence” is not a talking point. It’s THE Message.

7) **Now add the muscle to the bone in an outline form.** Provide the key support information to that “one-sentence.” No fat. Just muscle. Adding more information than needed may waste time. It may also lead you into unintentional errors and start diverging from the actual answer. If “One-sentencing” gets the reader’s attention, a gristle-free answer will keep it.

8) **Add the “So What?” Section (if needed).** I.e., “Explain WHY this matters?” If the professor wants “greater implications” of a given matter (such as at the end of the essay question), then provide it, once again, in a gut punching “one-sentence.” Then substantiate it to complement the earlier material you wrote (try to avoid bringing major issues out from the blue here if you can help it). (Same rules apply.)

9) **Check your head work. Check your premises. Because you are about to “commit!”**

10) **PEN THE ANSWER** (notice that it took all this time to get here!)
    a. **Tell’em what they want to know - NOW.** Give that “one-sentence” answer (and if the broader impacts are requested, add them too briefly as a teaser to the conclusions). This may be all the professor has to grade (which does not mean that you don’t have to write any more). To be more accurate, this will show the prof, there is an answer here. If your response is necessarily long, it will show “good faith” up front that you are not “BSing.” If it’s a pithy one-paragraph answer, then you’re almost done anyway. Include the “money-quote,” explicitly citing the “what” in the “what-is?” part of the question. Leave no doubt in the professor’s mind that you are a to-the-point sort of person. We tend to like that.
    b. **Demonstrate or prove the point.** Provide sufficient information to answer the question. Be careful not to make mistakes here or digress. The only thing worse than never getting the reader’s attention is to lose it completely midway. The “good faith” that you earned with your lead sentence may be lost.
    c. **“Quod erat demonstrandum, Baby!”** (Dolby, T., 1988). Wrap it up, if you need to. Provide any concluding materials. This would mostly be any application-oriented sub-question, greater implications, etc.
    d. **Check your answer against the question.** ‘cause you’re gonna feel really dumb if you didn’t answer it or missed a critical point after all that noodle work!

If you kept your head, this answer will be as long as it needs to be – which is just right. (It can be a short paragraph or a few well-written ones all answering the same question and offering no doubt to the reader that you know your stuff). I tend to write in class exams so that they can be answered in about five sentences max (sometimes with figures). At most, my extended or take-home exams questions can be similarly written (but may require more head-and-dog work). Your goal is not to be wordy, but efficient in your writing.

4 **What if I don’t know the answer at all?**

We’ll we can’t help you much there as far as writing goes. If you try to BS your way through things, it will show. The best strategy here is to know broader material and keep your head. In the pre-answer phase, you will need to back up a bit and start re-approaching the questions, if necessary from first principles and move forward. Normally, we won’t try to “stump” you just to see you flop around on the pier. HOWEVER, we may coin a question to see if you can think out of the box. Once again, your response should be able to quickly communicate your answer and show that you are a solid thinker and solution finder or maker. That’s what makes a good scientist and engineer.

5 **OK. Practice what you preach because you took your time getting to that last key part.**

To once sentence this document:

“Give the prof what he or she wants – correctly and ASAP – and you’re well on your way.”

6 **References**