Joe's Advice on Exams

These notes represent my personal thoughts on how to do well at exams, based on my experiences as a student at Cambridge. Your mileage may vary.

First, what are exams and what are they not? They are not (directly) a measure of your overall interest in physics, your overall ability in physics, or your deep understanding of the subject. While they may indirectly measure these, what they directly measure is your ability to solve correctly a certain number of questions within a specified time limit of not greater than three hours.

Good exam performance will not by itself make you a better human being or a better physicist. It will however enhance your chances, both within and without physics, to follow the path you want and to have the opportunities you would like to have. It is therefore useful to optimise your exam performance.

As exams are about solving a certain number of questions within a time limit, it is important to **make your preparation specific to this task**. If you act in a play or perform in an orchestra, you practise many times beforehand and have a dress rehearsal. If you row on the river, you make many outings beforehand so that your muscles know what to do when Torpids arrive. **The same is true of exams.** To borrow a sporting expression, train hard and race easy.

Your aim in all exam preparation is that your ability to do the exam should peak on the day of the exam, not two weeks before and not two weeks after. Your preparation should then work backwards from where you want to be on exam day. Below is a guide timetable:

Up until about 6 – 10 weeks before exams: in this period your priority is to **learn and understand the course**. This means reading the notes carefully, thinking about the physics and doing the problem sheets. This is not yet a time for exam-specific preparation: rather now is the time for deep learning where you absorb the material and what it means.

From 6 weeks before: you should be including past paper questions in your revision as your focus shifts to the particularities of an exam. Past paper questions are **specific** to what you have to do in the exam, and therefore are the most accurate form of preparation. Start by doing past paper questions with the notes/textbook, and then move to attempting them blind, where you do say a single section B question within the time and without recourse to notes. Time yourself and see how long it takes. My experience was that **attempting a question blind and to a time limit is a very acute measure of whether you really know and can reproduce the bookwork you think you understand.**

This bears repeating: for exams, you do **NOT** know bookwork **unless** you can reproduce it accurately, fluently and under exam time constraints. There are no marks for knowing which page of Binney+Skinner the derivation you need is on.

Know the bookwork and know the past questions that have come up: examiners are not ogres and not are infinitely creative. At least half the marks, and often up to 75%, will be either for bookwork or for straightforward applications of bookwork, and large parts of many of the questions will have already come up on past papers. What you want to aim for is that when you turn the exam paper over you can recognise many of the questions.

1-3 weeks before: I recommend doing a full dress rehearsal (yes, I mean it) for your exams, neither too far in advance or too close to the actual day. What does this mean? Suppose your exam is at 9am. This means keep one of the past papers `safe', so you do not look at it during any of our previous revision, and have seen none of the questions. Get up at the time you would for the real exam, have a shower at the time you would for the real exam, have the breakfast you would have for an exam. Lock your door, change into sub fusc, ensure you have the pens, ruler, data book etc, you would have for the exam. Then at 9am turn over the paper, and do it for the next three hours, with no distractions, no looking at textbooks, just do it as if it were the real thing.

In the few days before the exam: now is not the time to be desperately cramming. Go through the entire stack of past papers (~10 years worth). Read the questions and visualise in your mind how you would do them. If there are parts you have no idea how you would do (and they are still on syllabus), then maybe you can try and work through them lightly with the notes/textbook. It also makes sense to practise your bookwork derivations so they are drilled and ready to go (eg in quantum mechanics `work out the first order change in the eigenstate for a perturbed potential')

The night before the exam: Ensure that your sub fusc clothes, your Bod Card, your pens, and generally everything you will need for the exam is present and correct. Don't try and cram through the night, but try and visualise the topics in the course and yourself answering the questions well.

On exam day: get a good night's sleep the night before, eat well, and get to the exam in plenty of time. Get in the zone, and lightly visualise in your mind the types of question that might come up.

Within the exam: read the paper first. Spend the first 5-10 minutes reading the paper and absorbing the questions before you start writing (this is compulsory in the part B papers where 10 min reading time is included). Then **get the easy marks first** - start with the questions you absolutely know how to do, irrespective of the numbering, and gradually work your way onto the harder questions. The logic of this is that, having read the questions at the start, your brain can do marvellous things in its subconscious – give it one or two hours to work away internally at the harder questions while you are writing out the easier questions.

Towards the end of the exam: if you have any time left, **be professional.** Check your answers. On bookwork questions, ensure you have got down absolutely everything the examiner could possibly be asking for. If there are questions you are lost on, write bullet points of how you think the answer should go, and what you think the relevant physics should be. Also check the end of these questions – sometimes there is an `easier' part (`Discuss the limit m -> 0') which you might be able to answer even if you were lost on the main part.

After the exam: forget it immediately. It is done and you cannot change it. You have your next exam soon.