Exam II is based on material covered in class since the cutoff for Exam I. The exam will be distributed on Thursday, April 25 (the final TR class of the semester). They are due in my office no later than 11:00 a.m. on Tuesday, May 7.

Please begin working on your exam as soon as possible. You need to realize that my Chem. 360 students, of whom there are a great great many, will try to monopolize my time as their final exam approaches. Because their exam is on Monday, May 6, from 8:00 until 10:00 and because I plan to leave the building immediately after the exam ends so that I can grade at home, it will be IMPOSSIBLE for you to ask questions or to seek help on May 6. It also may be very difficult to get individual attention from me on the morning of May 7, as I'll still be involved in assigning letter grades to the horde of angry pre-meds, all of whom will be converging on my office in a fit of murderous pre-medical-induced frenzy. In other words, plan on getting your questions answered no later than Saturday, May 4.

My time in answering the exam was 109 minutes, somewhat more than the 90 minutes that I spent on Exam I. Because of the increased length and difficulty of Exam II, its points add to 300, instead of 200; i.e., it counts for 60% of the course grade.

The questions are drawn from a broad time frame: some are old, some are new, some are borrowed ... (oops, I got carried away). But it is true that some are classics from the early days of orbital symmetry, whereas others are as fresh as the most recent journals. There are, in fact, four citations to work that was published in 2002. Copies of the reprints that I used to write the exam questions are available to the first person who asks. (I made the same offer for Exam I, but thus far nobody has shown any interest in having copies of those articles. So, that old offer is still on the table: if you are the first to ask, regardless of whether or not you are taking the course for credit, the reprints are yours.)

As the post-exam note from Exam I indicates, I was disappointed in the kinds of answers that some of you wrote. You pushed electrons with nice curved arrows, but you failed to take into account what orbital symmetry had to say. Recall: just because you can push electrons in a cycle doesn’t mean that a reaction (e.g., a $[^\pi_2S] + [^\pi_2S]$ cycloaddition or a $[^1S:3S]$ sigmatropic shift of H) will occur. I guarantee that everything on Exam II is based on material that we covered in the course; if something looks totally alien to you, it’s because you haven’t prepared properly.

As was true for Exam I, I’ll answer “study” questions up to the time that the exam is given out; after April 25, the only questions that I’ll answer are those that are related to the exam. [An exception: Question IV on the exam is based on material that we will be covering this week and next - you are permitted to ask “study” questions on these fluxional compounds, even after you have the exam in hand.]

Because this is a 600-level course, you get four quotations on the exam! For Exam II we are pleased to feature the wisdom of Neal Stephenson (a futurist and novelist [if interested, see http://www.cryptonomicon.com/author.html] - the quotation I "borrowed" from the infamous Maitland Jones), Michael J. S. Dewar, William von E. Doering, and Vikram Seth (a contemporary writer, author of "A Suitable Boy", a 1300-page novel that you can probably finish in a weekend ... or two.)
The practice exam from 1990 is exactly that - something for you to practice on, to see how well you are understanding the material. It's a mistake to look at the answers to the old exam before you've finished your studying and before you've attempted to answer the questions. If you've not yet availed yourself of the opportunity, you should plan on borrowing copies of the old exams and the answers for photocopying. Also available for photocopying are the answers to the exercises assigned in class.

The rules for the two exams in Chem. 650 are similar to those from Chem. 550. They are shown here (and also at the top of each exam).

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**ORBITAL SYMMETRY (COURSE) SELECTION RULES:**

ALLOWED PROCESSES: You may consult: your class notes, handouts, and problem sets; the textbook for this course; the 1990 exam and answers; and any of the standard textbooks on orbital symmetry (listed on pp. 3-5 of Books and Review Articles.). You should also feel free to consult me when you run into difficulties; although I will not "give away" any answers, I will try to guide you to find the solution on your own. Once the exam has been distributed, I will only answer questions related to it; I will no longer answer questions on study materials.

FORBIDDEN PROCESSES: You may not search the primary literature (syllabus) or secondary review literature (pp. 5-46 of Books and Review Articles) for answers to your questions, nor may you seek assistance from classmates, other students, faculty (except for "yr obdt srvt"), faith healers, or anyone else, living or dead, real or imaginary.

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You'll be writing your answers in blue examination books. There is absolutely no need for you to work out the answers on scratch paper before transcribing them into the blue books. This is an exam, not a term paper; as such, it doesn't matter if there are erasures, cross-outs, etc. I'll give you three blue books at the start, but if you find yourself succumbing to a bout of logorrhea (look it up!) I'll provide extra books.

The material on the exam is distributed as follows:

I. (75 points) **PSYCHO ADDITION REACTIONS** This is a lovely multi-part question about the types of cycloaddition, both forward and reverse, that were covered in class.

II. (95 points) **SHIFTY AND SHIFTLESS ATOMS** The topics in this multi-part question are the lovely sigmatropic shifts that H and C can undergo. (There are two parts of Question II that address issues that are not related to orbital symmetry; they are clearly identified as FOR NO CREDIT, JUST FOR FUN.)

III. (35 points) **COPING WITH ADVERSITY** Here are some lovely questions about the Cope and similar rearrangements.

IV. (95 points) **A STATE OF FLUX** More lovely questions from the universe of fluxional molecules.