Project 4B: Last Year’s Exam

*This project will likely take you several sessions to complete. Plan to meet at least twice with your group to work on it.*

*This is due Sunday, November 8, by the end of the day. Groups with a member who is participating in the US election as a volunteer for a campaign or as a poll worker, or who is involved in demonstrations or civic activity following the election in response to a contested result, are eligible for an extension on this assignment.*

*You should email this document, with all the figures and text you have added to it, to* [*suast101projects@gmail.com*](mailto:suast101projects@gmail.com)*. The subject line should be the one posted on the assignment page.*

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| --- | --- | --- | --- |
| **Group Number:** | |  | |
| **Member Name #1:** |  | **Email #1:** |  |
| **Member Name #2:** |  | **Email #2:** |  |
| **Member Name #3:** |  | **Email #3:** |  |
| **Member Name #4** |  | **Email #4:** |  |
| **Collaboration Time and Date:** |  | **Evaluating Group Number:** |  |
| **Collaboration Methods (in-person, Zoom, etc.)** |  | | |

In this project, you’ll work on problems from last year’s exam. You will first create explanations for another group for a series of problems from that exam. Your explanations should include a full explanation of how you know what the answer is and why. Also, it is great if you are able to relate one problem to the next -- comparing and contrasting the ideas used in different problems.

You will, of course, have to figure out the answers yourself. You can and should discuss this with other groups on Piazza. *However, you may* ***not*** *ask questions like “What is the answer to #17?”* without explaining why you think that this is the answer.[[1]](#footnote-0) You *may* present your reasoning for the problem and ask for comments, of course!

Then, your group should prepare a “study guide” on the general ideas involved in your problems. This should be substantial -- a set of notes that would prepare your audience for an exam like this one.

***Your audience for this project is another group in our class.*** This means that you can assume that the other group has had the same experiences you have -- going to class, doing your labs, and so on. So you may say things like “Remember how in Lab 8 we did such-and-such…”

Here is last year’s exam: <https://walterfreeman.github.io/ast101/exam3-2019.pdf> .

**Look at Problems 4-6. Explain how you know what the correct answer to each is.**

**Look at Problem 8. Explain how you know what the correct answer to each is. Discuss how you know each of the incorrect answers is incorrect.**

**Look at Problem 9. Explain how you know what the correct answer is. Your explanation should relate this process to things we can do in a laboratory on Earth.**

**Look at Problems 10-13. Explain how you know the correct answer to each, and relate these explanations to each other.**

**Look at Problems 14. Explain how you know the correct answer. Then discuss how our eyes might be different had we evolved under a star that was 3500 K.**

**Look at Problem 18. Explain how you know the correct answer.**

**Look at Problem 19. Explain how you know the correct answer. Your explanation should include an estimate of the temperature in Kelvin of the snowman and yourself.**

**Look at Problems 20 and 21. Explain how you know the correct answer.**

**Look at Problem 24. Explain how you know the correct answer. Then discuss what influence the Earth’s atmosphere and the Moon’s phase would have on the problem. (Why did we mention them at all?)**

**Below, write your study guide. You may also write it in another format and attach that document to your email. You should include pictures and figures that you create, and may include videos that you created, etc. Groups doing an exemplary job here may receive substantial bonus credit. If you include figures anyone else created (e.g. a reference for the EM spectrum), please cite them.**

1. You may use any online resources you wish for this assignment, of course -- the point is for you to learn things! However, you may *not* post these questions to Chegg or similar websites and ask for solutions to them in particular. (This is a general prohibition in our class; this sentence is just here as a reminder.) [↑](#footnote-ref-0)