Study questions for [GS] Chapter 5: Immature Science.

1. What is a paradigm, according to a "broad sense"?
2. What is a paradigm, according to a "narrow sense"?
3. What are some characteristics of "normal science"?
4. How do Popper and Kuhn disagree over the "openness" of science?
5. How do Popper and Kuhn disagree over the nature of the processes that govern science?
6. What is the relation between a scientific field and a paradigm?
7. What is the difference between puzzle-solving and problem-solving?
8. What is an "anomaly"?
9. How is a paradigm like a well-shielded and well-designed bomb?

Study questions for [K] Chaps 1-2; Postscript Intro & Section 1: Immature Science.

Chapters 1-2.

1. Why might a question like "When was oxygen discovered?" be the wrong type of question for a historian of science to ask?
2. Why might we question the view of science that sees it as a process of accumulation of individual discoveries and inventions?
3. In studying Galileo's contributions to science, why does Kuhn think we shouldn't compare his views with modern science, but rather with those of his contemporaries?
4. Why is it advantageous that normal science often suppresses fundamental novelties?
5. How does Kuhn first describe scientific revolutions?
6. What does Kuhn mean when he says "Scientific fact and theory are not categorically separable, except perhaps within a single tradition of normal-scientific practice"?
7. How does Kuhn define "normal science"?
8. How does Kuhn first define a paradigm? What are some of his examples?
9. According to Kuhn, what distinguishes the period in the history of optics prior to Newton from the period that came after Newton?
10. What are some of the reasons Kuhn lists that make it difficult for paradigms to be established?
11. In order for a theory to be accepted as a paradigm, does it have to explain all the facts with which it can be confronted?
12. What role do textbooks play in a paradigm? Why are they advantageous for the creative scientist?
13. How does Kuhn explain the fact that writing a textbook in a well-established paradigm usually impairs your professional reputation, as opposed to enhancing it?
14. How does Kuhn explain the fact that most scientific journal articles in well-established paradigms are incomprehensible to the layman?

Postscript: Intro & Section 1.

15. What are the two senses of "paradigm" that Kuhn identifies?
16. In what sense is Kuhn's initial explanations of the term "paradigm" circular? Why does Kuhn think this can be addressed by sociological studies of science?
17. According to Kuhn, what characterizes a scientific community?
18. What characterizes the transition from a "pre-paradigm" period to a "paradigm" period?
19. According to Kuhn, what does a paradigm govern: a *subject matter* (like "physical optics" or "electricity"), or a *community*? Why does he think this distinction is important?

Study questions for [K] Chaps 3-5, Postscript Sections 2-3: Normal Science.

Chap 3

1. How do paradigms gain their status?
2. In what sense is normal science made up of "mopping-up" operations?
3. What is one type of fact-gathering in normal science that Kuhn describes?
4. What are three ways in which experiments are used to articulate a paradigm?
5. What is one type of theoretical problem that normal science is concerned with?

Chap 4

6. If the results gained in normal science are not novel, why are they significant?
7. What is a "puzzle", according to Kuhn? How does it differ from a "problem"?
8. What roles does a paradigm play as a criterion for choosing problems?
9. According to Kuhn, what is one of the reasons why normal science appears to progress rapidly?
10. In addition to having a solution, what more characterizes a puzzle?
11. What is one type of restriction a paradigm places on constructing solutions to the puzzles it poses?

Chap 5

12. Can you know what rules a scientific community is using to conduct its research just by knowing what paradigms it shares? Why or why not?
13. Why does Wittgenstein think that things like games or chairs cannot be described simply by a common set of characteristics? How does he think we identify such things?
14. Why does Kuhn think that things like rules that govern research programs cannot be described simply by a common set of characteristics? How does he think we identify such things?
15. What are some reasons Kuhn gives for believing that paradigms determine normal science without the intervention of discoverable rules?

Postscript, Sections 2-3

16. What is a "disciplinary matrix"?
17. What are some components of a disciplinary matrix?
18. What is an exemplar, and why does Kuhn think it is "the most novel and least understood aspect" of his book?
19. What is "tacit knowledge"? In what sense is the knowledge gained from exemplars tacit knowledge?