

***Study Questions for Mid-Term Examination*****Science and Pseudoscience**

1. The logical positivists proposed verifiability as a criterion of meaningfulness. Karl Popper proposed falsifiability as a criterion of demarcation. What is the difference, if any, between the two kinds of criteria? In your opinion, which approach—meaningfulness or demarcation—more appropriately captures the proper task of a philosophy of science?
2. What, according to Popper, is the main reason why Einstein's general theory of relativity counts as scientific, whereas theories like Marx's theory of history and Freudian psychoanalysis do not?
3. According to Kuhn, what truly distinguishes a mature science from a discipline in the pre-paradigm stage of development is the presence of the pattern of activities characteristic of "normal science." What does this term mean for Kuhn? Using some specific examples, show how Kuhn's model of the development of sciences can be made to yield a criterion of demarcation.
4. What does Lakatos mean by a "research program"? How, using this central methodological concept, would Lakatos handle the demarcation program? Why does he think his approach superior to those of both Popper and Kuhn?
5. What were the basic points in Michael Ruse's argument that aimed to establish that creationism is not a science? What were Larry Laudan's main criticisms of Ruse's approach?
6. Let's say that instead of calling Ruse as witness, the prosecutor in the Arkansas evolution case had called Thomas Kuhn. How do you think Kuhn would have testified?

**Rationality, Objectivity, and Values in Science**

7. Give a sketch of Kuhn's model of paradigm conflict in science. What are the main features of this model that led many readers to conclude that it implied a thoroughgoing relativism?
8. How did Kuhn attempt to save himself from the charge of relativism by talking about the role of shared values in the resolution of paradigm conflicts? Is Kuhn's defense of himself successful?
9. Ernan McMullin responds to Kuhn's invocation of values in the adjudication of paradigm disputes by making the distinction between epistemic and non-epistemic values. What is the point of this distinction? Is it a valid distinction? How does it work to save the objectivity of science?
10. What are the essential features of Laudan's critique of Kuhn's revolutionary model of the development of science? Is the critique a fair one?
11. Helen Longino attempts to turn the tables in the debate over social values and the objectivity of science by argue that it is the social dimension of science that is crucial to its objectivity. Give a sketch of her argument and critically evaluate it.
12. Kathleen Okruhlik argues that if all theory evaluation is comparative if we accept a role for social factors in the generation of scientific theories, then social factors are unavoidable in the evaluation of scientific

theories as well. How does this argument work? Show how Okruhlik illustrates her argument with examples that exhibit the role in science of assumptions about gender.

### **The Duhem-Quine Thesis and Underdetermination**

13. What is meant by the thesis of underdetermination? What is Pierre Duhem's basic argument for the underdetermination of theory choice by evidence in physics? Why does he think that underdetermination might not be a problem in other sciences?

14. How does Duhem's version of conventionalism differ from that of Henri Poincaré or Eduoard LeRoy?

15. Give a sketch of W. V. O. Quine's critique of the analytic-synthetic distinction. (Be sure to explain what the distinction is in the first place.)

16. How, on Quine's view, is the denial of the analytic-synthetic distinction related to the argument in favor of a sweeping version of the underdeterminationist thesis?

17. What are the principal differences between Duhem's version of underdeterminationism and Quine's? Which, in your opinion, makes more sense?

18. Critically evaluate Larry Laudan's criticism of Quine on underdetermination.

### **Induction, Prediction, and Evidence; Other Questions**

19. Give a sketch of Hume's classic argument that induction cannot be justified.

20. What is the paradox of the ravens? What does it show about simple attempts to give a descriptive account of inductive practices?

21. What is Nelson Goodman's "new riddle of induction" (the "grue-bleen" paradox)? How does it offer a more serious challenge than Hume's earlier skeptical doubts about induction?

22. What is the point of the distinction that Hans Reichenbach introduced between the "context of discovery" and the "context of justification"?

23. Explain the intended difference between a normative and a descriptive approach in the philosophy of science. Can the two approaches be clearly distinguished?

24. In your opinion, is Quine right in arguing for the indeterminacy of radical translation?