

**Ph.D. General Examination in Philosophy of Science**

Answer four of the following questions. You have four hours to do so. Each question is of equal worth. If what you say in answer to one question can contribute to your answer to another question, you need not repeat what you have already written. You may refer to your earlier answer.

1. What is “Hume’s Problem of Induction”? Explain the problem. Provide what you take to be the best solution to the problem. Does this solution really work? If so, explain how it resolves the problem. If not, explain how it fails.
2. There are various kinds of Bayesian accounts of hypothesis confirmation. Explain the best Bayesian account you know of. What are its strengths and weaknesses. Describe how this Bayesian account differs from at least one alternative account (such as classical frequentist methods, or the hypothetico-deductive method, or falsificationism)? Is one approach better than the other? Explain.
3. Answer only one of the following questions:
  - 3.1 What is the Raven Paradox? What is the paradox supposed to show? What do you take to be the best solution or resolution of the paradox?
  - 3.2 What is Goodman’s “New Problem of Induction” (a.k.a. the “grue problem”)? What is this problem supposed to show? What do you take to be the best solution or resolution of the problem? Is this resolution satisfactory, or does the grue problem show that no inductive method can work? Explain.
4. What distinguishes science from other kinds of claims to knowledge (e.g. philosophy, common-sense knowledge, pseudo-science, others)? What is “pseudo-science”? Describe some approaches to demarcation, and defend the one that you take to be the most satisfactory.
5. What is meant by the “underdetermination of theory by evidence”? What epistemological threat does underdetermination pose to the objectivity of science? What is the best proposed solution to this problem that you know of? Does it work? Explain.
6. Describe a non-realist account of the status of scientific theories – i.e., either an instrumentalist account or a “constructive empiricist” account. Contrast this with a scientific realist view. What is the strongest argument for the non-realist view? What is the best realist response you know of? Which view do you think has the stronger argument? Explain.
7. Compare a regularity account (e.g. the so-called Ramsey-Lewis account) to a necessitarian account of *laws of nature*. What is the chief motivation for each account? Which is the better account? Explain.

8. What do you think is the best account of the ontological relationship between fundamental physics (including micro-physics and relativity theory) and the subject matter of the rest of the sciences – the so-called “special sciences” (including non-basic physics (e.g. fluid dynamics), chemistry, biology, psychology, etc.). Are the non-basic sciences reducible to fundamental physics, or supervenient on it, or emergent, or related to fundamental physics in some other way? Does the *realization* of special science properties (events) by micro-physical properties (events) threaten to make the the former epiphenomenal? Why, or why not? Explain.
9. Explain Hempel’s deductive-nomological model of scientific explanation. Contrast it with a causal account of explanation. Describe a major problem with the Hempelian account (e.g. “the flagpole”). How does the causal account overcome this problem? Do you think the causal account suffices as an account of “scientific explanation” – why, or why not?.
10. What is the “measurement problem” for quantum theory? Describe and explain at least two interpretations of quantum theory. How does each interpretation address the measurement problem? Which is the more plausible view (consistent with current evidence)? Explain.
11. What is “group selection” (as opposed to “kin selection”), and what is the main argument for the claim that group selection is evolutionarily impossible. How have defenders of group selection (such as Elliott Sober) replied – e.g., what kind of model have they offered to show that group selection may be evolutionarily possible? Do such models succeed in showing how group selection may be evolutionarily possible? Explain.
12. Answer only one of the following questions:
  - 12.1 Discuss the role of non-epistemic values in science. Do any non-epistemic values play a legitimate role in science? If so, how do they complement and/or interfere with epistemic values? In what sense is science *objective*? Do non-epistemic values threaten to undermine the objectivity of science? Explain.
  - 12.2 Describe a feminist standpoint theory in philosophy of science. Describe some feminist critiques and conceptions of objectivity. Discuss some of the main issues raised by external critiques of feminist epistemology, as they apply to the scientific enterprise. To what extent are these critiques correct or mistaken? Explain.