PHILOSOPHY OF SCIENCE - Final Exam Review Guide

1. Exam Time and Room

The exam is Tuesday, June 26, from 2:00 - 4:00 PM, in Tory 210. Students who have made alternative arrangements are writing in the Paul Merton Centre.

2. Exam Format:

Part I: 10 Multiple Choice questions (10 marks)
  • Note: 5 of these questions ask you to say whether the usage of a term is "epistemically loaded" or "epistemically neutral"
Part II: 5 "Define/Explain the Following Terms" questions (5 x 2 marks = 10 marks)
Part III: 1 Multi-Part Question (10 marks)

Total adds to 30 marks, but I'll be re-calculating the total as a grade out of 20, since the test is worth 20% of your final grade.

E.g. 25/30 = 16.7/20. I will round to the closest single decimal (e.g. 16.666… = 16.7).

3. Multi-Part Questions to Review

For Part III of the exam you'll be given ONE multi-part question around a single topic. You'll need to answer all questions in the set.

Below I've given THREE such question sets. I'll put ONE of these sets on the exam, exactly as written.

  1. Policing Scientific Language

  (a) We've seen many attempts in articles and videos to legislate the "correct" use of scientific language. What is the broader context that is motivating these attempts?

  (b) Why are most of these efforts to legislate the usage of scientific language fatally flawed?

  (I gave three independent reasons in the notes. For each reason, state it, and give an example, based on what we've learned in the course, that illustrates it)

  (c) Still, a good understanding of scientific vocabulary is an important part of science literacy. Given what you said in part (b), what sort of understanding of scientific language *should* we be going for?

  (Our answer in the notes had three parts).

[The notes for this question are under Main Lecture Topics > The Vocabulary of Science > sections 1, 2 and 3. But note that in part (b) I'm asking for examples to illustrate the points, which should be drawn from the material we've done in the course.]

2. Kahan on the "science communication paradox"

(a) What does Kahan mean when he says that the public's views on the risks of climate change are politically polarized?

(b) How might a supporter of the "public irrationality thesis" explain these differences in public attitude toward the risks of climate change?

(c) Kahan argues that the public irrationality thesis is not a good explanation for these differences in public attitude. What is his argument?

(d) What is "cultural cognition"?

(e) How does the cultural cognition thesis explain the science communication paradox?

[The notes for this question are under Main Lecture Topics > Notes on Cultural Cognition and the Science of Science Communication.]

3. Truth of Models and Theories

(a) What is the "abstraction hypothesis", and what role does it play in reasoning about the world with models?

(b) Give an example that illustrates why confirming the predictions of a model doesn't necessarily confirm the assumptions of the model.

(c) Why are scientists often hesitant to say that a theory (or model) is "true" or "false"?

(d) What do they feel more comfortable saying?

(e) What is an interpretation of a theory (or model)? Explain some of the challenges of giving one?

[The notes for this question are under Main Lecture Topics > The Vocabulary of Science [continued] > 9. What is a Model?]

4. List of Concepts

Below is a list of terms/concepts about which there may be questions. In Part II you'll be asked to give a definition/explanation of the meaning of a concept.

epistemology; epistemological/epistemic
epistemically loaded (EL) vs epistemically neutral (EN) uses of scientific language
empirical vs theoretical
EL senses of "theory", "fact", "law" and "hypothesis"
EN senses of "theory", "fact", "law" and "hypothesis"

virtue of a scientific theory; epistemic vs non-epistemic virtues
predictive power
explanatory power
models of explanation (covering law, causal-mechanical, unificationist)
subjective vs objective (un)falsifiability
simplicity/parsimony (ontological vs syntactic)
Occam's Razor

domain of application (of a theory, law or model)
counter-factual prediction
generalization
accidental generalization
physical necessity
foundational vs derived law
deterministic vs statistical/probabilistic law

the science communication paradox/problem
the public irrationality thesis
cultural cognition; the cultural cognition thesis
motivated reasoning

model; model as a tool for reasoning by analogy and by abstraction
analogy
reasoning by analogy
abstraction
reasoning by abstraction
abstraction hypothesis

interpretation of a theory or model