

Final Examination

Directions: This is a take-home examination, the answers to which are to be turned in by the close of business on Friday, May 7. You are to answer any four out of the following fourteen questions. Each answer should be on the order of magnitude (minimum, not maximum) of a thousand words, that is, three to four typed, double-spaced pages. Your answers should reflect not just in-class discussion but also a review of the relevant texts, and there is no rule forbidding you from consulting sources, either primary or secondary, beyond those included in the course readings.

1. Descartes presents his *Meditations* as (at least partly) intended to provide the philosophical foundation for (his) natural science. Briefly sketch the general outline of the foundation of Cartesian physics that Descartes develops in this work.
2. With examples drawn from his work in both optics and mechanics, explain what Newton means with his famous claim that he “frames” or “feigns” no hypotheses. In the specific case of the law of universal gravitation, explain how Newton understands this as a proposition “inferred directly from the phenomena and rendered general by induction.” Is Newton justified in this assessment of the methodological status of the law of universal gravitation?
3. Contrast Locke’s and Descartes’ respective views and treatments of the primary-secondary quality distinction.
4. In his correspondence with Clarke, Leibniz presents his famous ‘shift’-argument against the existence of absolute space. In class we mainly discussed a ‘static’ version of the shift, in which the relevant imagined possible worlds differ with respect to their locations in absolute space. In the correspondence one also finds other versions of the shift, in which the relevant imagined possible worlds differ with respect to their motions relative to absolute space. Explain how one can construct an argument against absolute space based on such a ‘motion’-shift. There are certain versions of ‘motion’-shifts that present a challenge to Leibniz’s theory of space. How so? How serious is this challenge?
5. Hume and Reid are both students of Newton, in the broadest sense of the word. Thus, they might agree when it comes to skepticism about a role for hypotheses in science and, yet, they disagree with regard to the more thoroughgoing skepticism that some associate with Hume. Give a sketch of the views of both Hume and Reid as they concern these two points of sameness and difference with an eye toward identifying the root difference in their positions.
6. Kant agrees with Newton that the inertial effects of circular motions distinguish true from apparent motions. Does this mean that Kant also agrees with Newton about the existence of absolute space?
7. What, if anything, is the genus of which both Comtean positivism and Machian positivism are species?
8. A number of the authors whose works we read this semester discussed the place of analogical reasoning in science, but they differed in their assessment of the degree of epistemic warrant attaching to the conclusions of analogical arguments. Compare, critically, the views of at least three of our authors on this question.

9. What were the main points at issue in the debate between Whewell and Mill over the role of hypotheses in science?
10. It can be argued that the development of electrodynamics in the nineteenth century had at least as much influence on the development of the philosophy of science as did the development of mechanics in the seventeenth century. With respect to what issue or issues was this influence chiefly felt in the nineteenth century?
11. Many contemporary thinkers credited Helmholtz with a major role in the Kant revival of the middle to late nineteenth century. How much of a Kantian was Helmholtz?
12. Mach, himself, used the expressions “biological-economical” and “historical-critical” to characterize his philosophical project. That project is remembered by many as a species of reductionist phenomenalism and a precursor of anti-metaphysical Vienna Circle verificationism. Nevertheless, after years of expressing serious skeptical doubts, Mach finally granted the reality of atoms in the wake of Perrin’s experimental investigations of Brownian motion. How, if at all, is one to weave these many threads together into a consistent picture of Mach’s philosophy of science?
13. The semiotic theory of knowledge has made an appearance in the writings of several thinkers whom we have discussed, including Reid, Helmholtz, and Boltzmann. Review these mentions of the semiotic view and discuss its philosophical significance.
14. Compare and contrast the views of Poincaré and Duhem on the role of convention in science. In what way does the contrast between their views anticipate the later division between the left and right wings of the Vienna Circle?