

Philosophy 1103: Introduction to Philosophy of Science

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Practice Quiz 5

Total: 40 marks

1. Laws of nature are often said to be ‘nominally necessary’, but not ‘logically necessary’.

(i) What is meant by “logical necessity?” Your answer should include one example of a logically necessary statement. [2 marks]

(ii) What is meant “nomic necessity”? [2 marks]

(iii) Illustrate the difference between logical and nomic necessity by writing one statement that is nominally necessary but not logically necessary. [2 marks]

2. Judge John E. Jones wrote in a 2005 judgement:

While supernatural explanations may be important and have merit, they are not part of science. This self-imposed convention of science, which limits inquiry to testable, natural explanations about the natural world, is referred to by philosophers as “methodological naturalism” and is sometimes known as the scientific method.

(i) Define what is meant by a ‘natural explanation’, and by ‘methodological naturalism’. [2 marks]

(ii) Philosophers are often sceptical of the idea that there is such a thing as “the scientific method”, as different branches of science use (somewhat) different methods. Nevertheless, summarise some key features of science that separate it from non-scientific theorizing. [3 marks]

(iii) In the text above, Jones seems to assume that testable explanations must also be natural. However, there seem to be examples of supernatural theories that are empirically testable. Describe one such case (it can involve either real or fictional data). [3 marks]

(iv) Jones also seems to assume that supernatural hypotheses must be believed (if at all) on the basis of authority and revelation (i.e. religious leaders and holy books) rather than empirical evidence. Is this always the case? Explain your answer. [2 marks]

3. In his *Origin of Species*, Charles Darwin argued for both evolution, or ‘transmutation’, and the theory of natural selection.

(i) Explain the difference between a kinematic theory and a mechanical theory. [2 marks]

(ii) Is the theory of evolution a kinematic or a mechanical theory? How about the theory of natural selection? [2 marks]

(iii) During Darwin's lifetime, were there scientists who believed in evolution but rejected the theory of natural selection? If so, then name some. [2 marks]

(iv) Summarise one argument given by Darwin for evolution. [3 marks]

(v) Summarise one argument given by Darwin for the theory of natural selection. [3 marks]

4. Judge Jones said that he was not aware of any scientific theory that would seem more plausible to those who believe in God. However, concerning the Big Bang theory, physicist Frank Tipler wrote,

When I was a student at MIT in the late 1960s, I audited a course in cosmology from the physics Nobelist Steven Weinberg. He told his class that of the theories of cosmology, he preferred the Steady State Theory because "it least resembled the account in Genesis".

(i) Explain why the Big Bang theory (the alternative to the Steady State theory) might seem more plausible to a theist (e.g. a Jew, Muslim, or Christian) than to an atheist like Weinberg. [3 marks]

(ii) In a similar vein, explain why Darwin's theory of evolution might seem *less* plausible to a theist than to an atheist. [2 marks]

5. Darwin wrote, "I do not think I hardly ever admired a book more than Paley's *Natural Theology*. I could almost formerly have said it by heart."

(i) Summarise William Paley's argument for his view that living organisms were made by 'an intelligent Creator'. [3 marks]

(ii) Summarise Darwin's criticism of Paley's argument, that is based on his theory of natural selection. [2 marks]

(iii) Summarise Mivart's objection to Darwin's theory of natural selection. [2 marks]
