Scientific Process Fall, 2011 – Final Exam

*You will be asked 2 – 5 questions for the final.*

Science and Pseudoscience

1. Please list and fully describe characteristics of science versus pseudoscience.

2. Develop an example of science that becomes pseudoscience.

3. Identify a topic that is frequently considered pseudoscience. Describe a research design that could be used to investigate the pseudoscience scientifically.

4. According to Carl Sagan, what is the “most precious thing”? do you agree, Why?

Peer Review

5. Provide three strategies that should be considered in a scientific peer review.

6. What ethical considerations should go into a peer review?

7. Peer review any one the following three following proposals; you will have a choice of topics. You are presented with a research objective and method section. In the peer review, critique the methods in terms of the research objective.

Scientific Structure

8. Please list and fully describe the components (parts) of a research proposal.

9. Please list and fully describe the components (parts) of a primary literature article.

10. What is the peer review process in science? How does the peer review process relate to the funding panel and the publication primary literature article?

11. What is the role of IRB and IACUC in science? What is the legal and ethical role of IRB and IACUC?

Ethics

12. Do scientists have an ethical obligation to explain the reason and significance of their science to society? Please explain.

13. What are some ethical considerations that are unique to science?

14. Identify a potential ethical issue or dilemma associated with your research proposal. Explain why the issue or dilemma is an ethical issue. Explain how you would resolve it.

15. Describe your ethical philosophy of science in terms of the different perspectives discussed this semester. How will the ethic stances affect your science?

16. Compare and contrast the institutional Review Board (IRB) and the Institutional Animal Care and Use Committee (IACUC). Include details about the research process, ethics, risks and benefits of these organizations in helping us realize vigorous and high quality research.

Types of Science/ Philosophy

17. What is the difference between basic “pure” and applied science? Which type of science of would you pursue in your own career? Why?

18. What is the definition of falsificationism? Why is it not always an accurate description of the scientific process?

19. Is historical science less scientific than falsificationist science? Why or why not?

20. Describe your scientific philosophy in terms of the different philosophical perspectives discussed this semester. How will this philosophy affect your science?