Questions for Exam 1

Scientific Thought I

Fall 2009

Exam 1 will consist of a selection of the following questions.

1. What are the features of Thales's work that make him count as the beginning of science? Explain how his work has each of these features.
2. What is everything made of according to Thales? Anaximander? Anaximenes? Which of these is closest to modern theory of matter? Justify your answer to the latter question.
3. For each of the following, describe what Anaximander and Anaximenes said about it, say which was closest to modern cosmology, and justify that judgment.
   (a) The shape of the earth.
   (b) What holds the earth up.
   (c) The orbits of the heavenly bodies.
4. What is the tetractys? How is it related to harmony, according to Pythagoras?
5. What are unlimiteds and limiters? What holds them together, according to Philolaus? How might he have thought that this works?
6. According to Parmenides:
   (a) What are the properties of what exists?
   (b) Why can't there be generation?
   (c) Why can't there be change?
7. Does Parmenides regard the senses as a source of knowledge? Explain.
8. In what respect does Anaxagoras agree with Parmenides about the properties of what exists? In what respects does he disagree?
9. When water evaporates from a boiling pot of water, what is happening according to Thales, Parmenides, and Anaxagoras? Which is correct according to modern science?
10. When condensation forms on a cold object on a humid day, what is happening according to Thales, Parmenides, and Anaxagoras? Which is correct according to modern science?
11. How are the theories of Anaxagoras and Empedocles alike? How do they differ?
12. Aristotle reports an argument of Democritus for the existence of atoms. Explain the argument.

13. What properties do atoms really possess, according to Democritus? What are some they don't really possess? What is the attraction of this view?

14. In Euclid, how does a postulate differ from (a) a definition, (b) a common notion, and (c) a proposition?

15. What are the two kinds of proposition called and what is the difference between them?

16. Prove the following proposition from Euclid:

    On a given finite straight line to construct an equilateral triangle.

    You don't need to state the numbers of the definitions, postulates, etc., that you use but you should indicate where you are using one; e.g., you can write "[C.N.]" when you use a common notion.

17. Prove the following proposition from Euclid.

    To place at a given point (as an extremity) a straight line equal to a given straight line.

    You don't need to state the numbers of the definitions, postulates, etc., that you use but you should indicate where you are using one; e.g., you can write "[C.N.]" when you use a common notion.

18. Prove the following proposition from Euclid.

    Given two unequal straight lines, to cut off from the greater a straight line equal to the less.

    You don't need to state the numbers of the definitions, postulates, etc., that you use but you should indicate where you are using one; e.g., you can write "[C.N.]" when you use a common notion.

19. In an ideal science, as conceived by Socrates, how would one explain why the earth is spherical? According to the "second best" method that Socrates actually uses, what is the explanation for why the earth is spherical?

20. For each of the following, say (i) whether Plato would classify it as knowledge or opinion, and (ii) what kind of knowledge or opinion he would classify it as. Explain why he would classify them in these ways.

    (a) Thinking there is a desk at the front of the room on the basis of seeing it.

    (b) Thinking that the angles in a triangle make two right angles on the basis of reading the proof in Euclid.

21. Socrates said "let's study astronomy by means of problems, as we do in geometry, and leave the things in the sky alone." What are problems in geometry? How could the study of astronomy be like that? In light of this, would you understand Socrates to be saying that astronomers need not look at the sky? Why, or why not?

22. Does Timaeus claim to know that the account of the heavens that he is giving is correct? Explain.

23. In the *Phaedo* Socrates said he wanted things to be explained by showing how it is best for them to be that way. Describe two explanations of this kind that are presented in the *Timaeus*.

24. Does Timaeus explain why each feature of the heavens that he mentions is for the best, or are there features that he mentions only because they are observed? Justify your answer.

25. Plato says that "this ordered world is of mixed birth: it is the offspring of a union of Necessity and Intellect." (48a) Explain what he means by this and give an example of something that Plato holds to be due to each of these two causes.

26. State a similarity and a difference between Timaeus's account of matter and that of:

    (a) Empedocles

    (b) Anaximander

    (c) Leucippus and Democritus

27. State Aristotle's definition of deduction. Give an example of something that is a deduction and something that is not. Say why your non-example does not satisfy the definition.

28. Can there be a deduction that is not a demonstration? Can there be a demonstration that is not a deduction? Explain.

29. When Aristotle says that a demonstration is from things that are prior to the conclusion, what does he mean by "prior"?

30. Which of the following terms of Aristotle apply to which of Euclid's terms?

Aristotle	Euclid
Principle	Definition
Axiom	Postulate
Posit	Common notion
Supposition	Proposition
Definition	

31. How did skeptics use the concept of demonstration to argue that understanding is impossible? What does Aristotle think is right and wrong in this argument?

32. Can non-necessary truths be demonstrated, according to Aristotle? What is Aristotle's argument for his view about this?

33. Give an example of something that Aristotle would regard as necessary and something he would regard as not necessary.

34. On Aristotle's view, can we demonstrate that a particular person got ill? Why, or why not? If the answer is "no," does it follow that medicine is not a demonstrative science? Explain.

35. State a similarity and two differences between the views of Plato and Aristotle on how the principles of a science are known.

36. For each of the following pairs of concepts, say how they are alike and how they differ.

    (a) Definition and property.

    (b) Definition and genus.

    (c) Property and accident.