The Categories, Aristotle’s Logic, and Aristotle’s Theory of Knowledge

1. In many ways, Aristotle can be viewed as positing answers to questions that Socrates raised but did not answer himself.
   a. (In some cases, Plato appears to have answered them in his teaching at the Academy, but Aristotle sometimes does not accept these answers, especially insofar as they involve the Forms, which is Plato’s fundamental principle.)

2. This is true of the question, “What is knowledge?” raised in the Theaetetus.
   a. (The Divided Line and its preliminaries, of the Republic, could be viewed as being addressed, rather than to the question “What is knowledge?” instead to the question “What is the object of knowledge?”)

3. Every solution that Aristotle offers to a philosophical or scientific problem presupposes both his theory of categories and his logical theory (with the exception of the problems that the theories of categories and logic themselves were intended to solve).
   a. Most of what we now call science was included in philosophy, formally speaking, an all the institutions of learning of antiquity. In a way, mathematics is an exception to this. Astronomy was included in mathematics. Thus the effect of this principle is to say that physics (and chemistry), biology, and psychology, were all in those times conventionally included in philosophy.

4. The main problem that the theory of categories is intended to solve, is the logical dimension of the problem of substance, or ousia. (This is the problem, “What is the fundamental existent, or that which is in itself or directly?)
   a. In Aristotle, the problem of substance also has cosmological and ontological dimensions, which are addressed in the physical works and the Metaphysics.

5. In the theory of categories, substance, the fundamental category, is the fundamental subject of predication, or that which is predicated only of itself. In the work, the Categories, the distinctive feature of substance, is that while remaining one and the same, it receives contraries. (From the Parmenides it appears that in the philosophy of Socrates, substance (ousia, the Forms) remains one and selfsame, but does not receive contraries. Even in the Sophist, which I see as a friendly external critique of Socrates’ theory, in which the Forms partake of one another, they do not receive contraries in the sense of changing their attributes.)
   a. In my opinion, in Aristotle, items in the non-substance categories have attributes, but they are unchanging and thus belong to definitions and whatever follows from them.

6. The distinction of the categories in detail is complex and obscure, but the following can be stated fairly simply:
   a. To SUBSTANCE it belongs to be the subject of contraries (successively), while remaining the same.
   b. Things are said to be similar in virtue of their QUALITIES.
   c. Things are said to be equal in virtue of their QUANTITIES.
d. Things are said to be correlative in terms of their RELATIVES. Examples: Parent-Child, Double-Half.

7. Almost every conceptual analysis that Aristotle undertakes begins with an answer to the question, “What category does X belong to?”

8. Aristotle created the first formal logic, or system of the principles of reasoning. His system of formal logic is presupposed in his account of the nature of knowledge (properly so-called). Formal logic is designed to solve the problem of distinguishing correct from incorrect reasoning.

9. Formally Aristotle’s formal logic consists of three parts—the theory of meaning, or semantics, the theory of propositions, and the theory of inferences or deductions.

10. Socrates’ theory of meaning is dependent on the theory of Forms—things get their names—all their names, saying what they are, how they are qualified, quantified, related, etc., from the names of the Forms in which they participate.

11. Aristotle rejects the Socratic / Platonic Forms as being unexplanatory and contradictory in their nature. To some extent he seems to embrace the criticisms against them of Parmenides in the Parmenides.

12. Aristotle’s semantics is based on the notion that a thought is in some way the likeness of the thing of which it is the thought. The spoken and written names of things, in turn, are conventional symbols of thoughts. Seemingly, the things of which thoughts are likenesses can be either particular, like Socrates, or universal, like man.

a. That Aristotle believes there are universal things like man is controversial. To me this seems to be the best interpretation of the texts, but it raises the question how these universal things are any different from Socrates’ and Plato’s Forms. I think the answer is that for Socrates and Plato what is fundamental is the Form, whereas for Aristotle what is fundamental is the essence as instantiated in the individual.

13. There are two kinds of names—names simpliciter, and verbs, which differ from names simpliciter in connoting time.

14. Propositions are combinations of names and verbs, like “John is running”.

15. Only propositions, not names, have truth or falsity in the primary sense. (Names have a kind of derivative truth if they name a real kind of entity, like “horse,” as opposed to a fictional one, like “unicorn.”)

16. Propositions are either affirmative or negative. For every affirmative proposition there is one and only one contradictorily opposed negation. This means that of the pair, it is always the case that one is true and the other false (in most cases).

17. Thus, whatever can be affirmed can be denied, and vice-versa.

a. To me this is an astonishingly liberating principle. There is often great social pressure not to say or think certain things. But Aristotle tells us that, nevertheless, those things are still possible thoughts that can be expressed. (In George Orwell’s 1984, a vision of nightmare totalitarianism, the Party is slowly converting language to Newspeak, a form of language in which it is only possible to express the views of the Party, not their negations. According to Aristotle’s philosophy, this would be a language in which thought itself would not be possible.)
18. Propositions can be necessarily, possibly, or contingently true or false. A necessarily true proposition is one that could not possibly be false. The propositions of pure mathematics are generally either necessarily true or necessarily false, in that they could not possibly be false if they are true or possibly be true if they are false. A proposition that is possibly true is one whose negation is not necessarily true. A contingent proposition is one that is possibly true and possibly false.

19. The application of these concepts within the philosophy of Aristotle is as follows: The physical heavens are eternal and incorruptible, and propositions about them are necessarily true or necessarily false. Terrestrial substances have tendencies to act and be acted on, which are generally but not invariably fulfilled. These tendencies can be known and explained scientifically, but their exceptions cannot, because they are random. The tendencies or potentialities of terrestrial substances can be the subject of necessarily true and false propositions, but in this case we are applying necessity only to the tendency, not the actuality. (I am in some doubt about this last point.)

20. Aristotle’s theory of inference or deduction is called syllogistic, or the theory of the syllogism. Although syllogisms as patterns of reasoning have characteristic forms, the word “syllogism” simply means “deduction.” The theory of the syllogism is meant to capture all valid patterns of reasoning, although later logicians, both ancient and modern, have discovered a number of patterns that apparently cannot be subsumed under Aristotle’s theory. In the twentieth century Aristotelian logic was generally replaced by a system called “symbolic logic” or “mathematical logic.”

   a. The syllogistic mood called “Barbara” has the form, “If B is predicated of all of A, and C is predicated of all of B, then C must be predicated of all of A.” Syllogistic is primarily a logic of classes, or sets.

21. Aristotle’s work, the Analytics, is divided into two parts, that respectively concern syllogistic as such and the application of syllogistic to a theory of knowledge.

22. The latter part of the Analytics, or the Posterior Analytics, develops the concept of the demonstration, or proof, which is a syllogism or deductive argument meeting certain additional conditions—namely that its premises be necessarily true and better known than the conclusion.

23. Seemingly knowledge or science that P is simply the possession of a demonstration or proof of P.

24. The premises of demonstration are of two kinds—axioms, which are the fundamental principles of all reasoning, and “basic truths,” which are intuited principles pertaining to a certain delimited domain of being.

25. Aristotle argues that proofs cannot be either circular or infinitely long.

26. The axioms, or principles of all reasoning, are all deducible from one principle, the so-called “principle of contradiction,” which is an ontological principle that states, ”Nothing can both be and not be at the same time and in the same respect.” From this principle follows the logical principle that an affirmation and its corresponding negation cannot be simultaneously true.

27. The basic truths (proper to or characteristic of delimited domains of being) are expounded only in one short and obscure passage, Posterior Analytics II, 19. I
interpret this passage as follows: once we observe a domain of phenomena completely, we intuit a finite and complete set of elementary connections and disconnections between universals. From these all truths of the science of the domain in question follow by means of syllogistic reasoning. Such intuition, Aristotle says, is a higher kind of knowledge than science, and on it all science is based. (Intuition in turn arises only in the context of sensation and systematic observation.)

28. Aristotle’s account of science seems hopelessly optimistic and naive in the light of the subsequent history of science. In my opinion Aristotle was misled by the adoption of a simplifying but wrong assumption: there is nothing too small or remote for its fundamental character to be observed by the unaided senses. Thus Aristotle thought that he was in possession of virtually all the data.

29. Aristotle’s account does, however, in my opinion, have the virtue of including both fundamental aspects of science, namely theory, and observation / experiment.