

ITEP Preparation

Section 1. Reading

Taxonomy and Scientific Knowledge

Most people think of science as a set of facts about the world. But more fundamental to science than the facts are the methods. In fact, many theorists believe that it is not objective reality that steers science, but rather the method of science that determines what we come to know as real. This reversal of what is commonly thought is exemplified by the development of taxonomy, the method of identifying and classifying organisms. Modern taxonomy, primarily developed by Carolus Linnaeus in the 18th Century, initially gave scientists a greater and more precise knowledge of nature. Today, however, taxonomic advances have led to question what they thought they knew about basic biological reality.

Taxonomy has been in use since Aristotle's work in the fourth century B.C.E. But early taxonomies were not very specific. Many contained such mythological creatures as griffins, right alongside existing animals. Further, it was thought that offspring could be produced by mating completely different creatures, like a lion and a bird. **A*** Aristotle, himself, used reason rather than observation, to divide animal life into two basic groups: animals with vertebrae (or backbones) and those without. Although this system proved inaccurate, it wasn't until Linnaeus' work that empirical observation became the basis for a modern taxonomy that excluded creatures of fantasy.

The movement toward a more modern system took its first big step in the 17th Century, with naturalists John Ray's definition of the concept of "specie". A species is a group of organisms capable of reproduction. The result will be an individual similar to the parents and capable of reproducing. **B*** Armed with this definition, Linnaeus was able to catalog over 4,000 species of animals and over 7,500 species of plants. He began with plant-life, dividing plants into species based on the number of pistils and stamens (the sexual organs) of each plant. This method allowed other botanists to contribute to the taxonomy. **C*** They simply had to observe and count, and a new specimen was added. Thus, biological knowledge grew tremendously.

However, since Linnaeus' time, biology has developed new taxonomic systems. One such example, cladistics, makes use of genetic analysis to classify organisms based on evolutionary descent (parent and child), rather than observable features. The problem is that this system has revealed relationships that are quite different from those of Linnaean taxonomy. **D*** Furthermore, organisms have been discovered that violate the rules of species inclusion. An example is where one organism may be able to reproduce with another, while that other one is capable of reproducing with a third, but the first and third cannot reproduce with each other. These and other surprises have scientists today questioning whether we understand species at all. Do species actually exist in nature, or only in our taxonomies? Perhaps this question will lead to new methods and technologies that will, in turn, radically change the nature of reality as we know it.

Question 1. The word “mythological” as used in the second paragraph most closely means the same as:

- a. Inspiring
- b. Religious
- c. Old-fashioned
- d. Inverted

Question 2. The author mentioned the example of cladistics in the last paragraph in order to:

- a. Show how a new taxonomic method leads to new views of reality.
- b. Provide an example of modern Linnaean taxonomy.
- c. Show how John Ray's definition of species still holds true.
- d. Show how the theory of evolution has not really been proven.

Question 3. Where would the following sentence most logically occur in relation to the marked sentences in the passage?

” Thus, a horse and a donkey, although appearing similar, are not the same species, since their mating leads to a sterile animal, the mule”

- a. Space A. Paragraph 2.
- b. Space B. Paragraph 3.
- c. Space C. Paragraph 3.
- d. Space D. Paragraph 4.

Question 4: The following is a sentence that begins a summary of the main points of the passage:

“Most people think that science is a body of facts about the world, but more basic to science than facts are the methods used to obtain them”

Continue the summary by choosing 3 of the 6 sentences below that best represent the underlined MAIN points in the passage. Mark 3 answers by selecting the appropriate checkboxes.

- a. Aristotle was the first to use taxonomy to classify organisms.
- b. Taxonomy is an important scientific method that distinguishes between fantasy and reality.
- c. Three different points in the historical development of taxonomy-ancient, Linnaeus, and contemporary-gave scientists three different understandings of the facts.
- d. More specifically, the concept of species changed with each new development in taxonomic methods.
- e. John Ray gave us the best and most precise definition for the concept of species.
- f. The historical development of taxonomy provides an example of how scientific methods determine facts about the world.

Section 2. Listening

Listen to each conversation and answer the questions below:

	What does the man intend to do? a. Make a reservation b. Take some aspirin c. Rest a little while d. Make dinner
	What is the woman's relationship to the man? a. She is his co-worker b. She is his sister c. She is his classmate d. She is his test taker
	What new facts about Einstein did Michael learn from Dr. Slansky? a. Einstein did not attend college at all because his family did not have the money. b. Despite working in an office, Einstein was able to think in new ways about the principles of Physics. c. Because of Einstein's religion, he was not able to attend the best college for the study of mathematics and physics. d. Einstein did not use previous scientists' and philosophers' writings to propel his intellectual thinking.
	It can be inferred from the passage that the woman... a. Is not very selective b. Is a vegetarian c. Is very patient d. Has very specific needs The restaurant owner suggested that the woman might like the hidden entrance because... a. She drives an expensive car b. Her guest list includes people who desire privacy c. She prefers to keep her identity hidden d. She runs a top-secret agency

Section 3. Grammar

1. Complete the sentence with the correct form of the verb in parentheses.

Despite the heavy rain, the game _____ (continue) as scheduled.

2. Identify the error in the following sentence.

Each of the students have completed their assignments on time.

- a. Each
- b. Their
- c. On
- d. have

3. Choose the correct word to complete the sentence.

She is one of those people who _____ always on time.

- a) Is
- b) Are
- c) Was
- d) Were

4. Identify the error in the following sentence.

If he had knew about the meeting, he would have attended.

- a. Had
- b. Knew
- c. Would
- d. Attended

5. Match each sentence halves logically.

If I were you,	the meeting than it started.
He wishes he	the report than I received feedback.
Had I known about the event,	I would take the opportunity.
No sooner had I finished	that she realized it was too late.
Hardly had she arrived	I would have attended.