

Ecology and Evolution - Exam 1

1. How did your instructor define a "hypothesis".
 - A. A hypothesis is a well tested theory.
 - B. Your instructor claimed that hypotheses are derived from the consequences of the theory, and predict what will happen in a specific circumstance.
 - C. Your instructor defined a hypothesis as being an educated guess.
 - D. As Greek for "below belief".
 - E. Hypothesis are a type of inductive argument.
2. According to your text approximately how old is the earth?
 - A. 4,500 years old
 - B. 45,000 years old.
 - C. 4,500, 000 years old
 - D. 45,000,000 years old
 - E. 4,500,000,000 years old
3. Two structures are "Homologous" if ...
 - A. they are present in both the ancestral and descendant species and serve the exact same function.
 - B. they are present in the descendant species and absent in the ancestral species.
 - C. they are present in the ancestral species and absent in the descendant species.
 - D. they are present in both the ancestral and descendant species.
 - E. None of above
4. Which of the following is NOT an advantage of the hypothetico-deductive model of reasoning?
 - A. Does not require that everyone agree on broad premises to begin with.
 - B. Allows new theories to be developed when new information becomes available.
 - C. Relies on observations that anyone can make to judge the validity of a theory.
 - D. Allows definitive proof that some theories are true.
 - E. Allows old theories to be discarded when observation contradict the predictions of the theory
5. What is the importance of inheritance in the theory of natural selection.
 - A. Inheritance of acquired traits promotes rapid change in the population.
 - B. Inheritance promotes population growth by assuring that all traits are equal represented in the next generation.
 - C. Inheritance assures that those traits that were advantageous to survival and reproduction will increase in abundance in future generations.
 - D. Inheritance of traits from parents insures that fewer varieties of traits occur in each generation.
 - E. Both C & D are Correct
6. What is the importance of variation the theory of natural selection?
 - A. Variation makes it likely that homologous traits will disappear.
 - B. Variation makes it likely that analogous traits will disappear.
 - C. Variation increases the likelihood that some individuals will produce more offspring in a given environment than other individuals.
 - D. Variation increases the number of compatible mates in a population.
 - E. Variation assures exponential growth of the population.
7. If all populations have the biotic potential to increase exponentially, why does the population size of most species stay relatively constant over time.
 - A. Homology
 - B. Analogy
 - C. Predators, disease lack of resources act as checks on population growth.
 - D. Species instinctively reproduce at less than maximal rates to assure steady population size.
 - E. Reproduction occurs less frequently than expected because so few individuals of one sex are receptive individuals of the other sex.

8. Which of the following is a prediction of the theory of natural selection.
- A. Species will become adapted to local environments.
 - B. Species are immutable and unchanging.
 - C. Species will become more advanced as time goes on.
 - D. New species will go extinct at predictable intervals.
 - E. Species do not go extinct, but instead always evolve into new species.
9. Which of the following is NOT a characteristic of science?
- A. Uses both deductive reasoning and inductive reasoning.
 - B. Fosters creativity and competition.
 - C. Is self-correcting.
 - D. Creates new knowledge by developing better and better explanations of how the world works
 - E. Always determines the "right" answer.
10. How did Darwin and Cuvier differ in their interpretation of the fossil record?
- A. Cuvier thought the fossil record was incomplete; Darwin thought that it was complete.
 - B. Cuvier believed in gradualism; Darwin believed in catastrophes.
 - C. Cuvier believed that a discontinuity in the fossil record should be interpreted as a discontinuity in the history of life; Darwin believed the discontinuities in the fossil record represented the incompleteness of the fossil record.
 - D. Both A and c are correct.
 - E. Both B and C are correct.
11. All the finches on the Galapagos islands are . . . ?
- A. Unrelated but descended from a common ancestor.
 - B. Descended from a common ancestor and therefore related.
 - C. Rarely compete for the same food source.
 - D. Really woodpeckers.
 - E. Identical to species in Peru
12. Why can't science be used to determine whether abortion is moral?
- A. Because any inference made by science would in contradiction to the revealed knowledge accepted by many people.
 - B. Because there is inadequate funding for the scientific study of abortion.
 - C. Because the causes of abortion are so many and so complex that no one theory can be brought to bear in all cases.
 - D. Because scientist by their very nature are immoral and evil.
 - E. Because are morality and immorality are intangible concepts that can not be physically observed or measured.
13. Why don't biologist like the phrase "survival of the fittest"?
- A. It leads to circular reasoning.
 - B. It implies inheritance of acquired traits.
 - C. The social implication of implying that nature does not treat all organisms equally is unpalatable.
 - D. There is no physical evidence to suggest that the most fit survive.
 - E. It does not translate form the original Latin phrasing.
14. What are homologous structures?
- A. Structures that serve the same function in two different groups of organism and therefore have been selected to have similar anatomical characteristics.
 - B. Structures that are anatomically similar in structure in two or more groups of organism because the structures are inherited from a common ancestor.
 - C. Structures that identical in two or more groups of organisms.
 - D. Structure that serve different functions and have different anatomical characters found in two or more groups of organisms.
 - E. Structures that are always found in pairs, like wings, ears, or legs.

15. What degree did Cambridge grant Charles Darwin in 1831?
- A. Engineering
 - B. Geology
 - C. Biology
 - D. Botany
 - E. Theology
16. Darwin argued that in 750 years elephants have the potential to grow a population from two elephants to over nineteen million elephants. Why would this argument be important to Darwin's theory of natural selection?
- A. Because one of the postulates of his theory was that the earth was very old.
 - B. Because it showed that there was variation within a species and that was one of the postulates of his theory.
 - C. Because no it explained why there were so many fossil elephants.
 - D. Because it showed that if unchecked all populations have the ability to grow exponentially.
 - E. Because it showed that elephants couldn't survive in environment they were not adapted to.
17. The theory of natural selection is best described as . . . ?
- A. An attempt to explain why extinction occurs.
 - B. An attempt to demonstrate that species were mutable.
 - C. An attempt to explain how species could change over time.
 - D. An attempt to show that catastrophism was wrong.
 - E. A, B and C are all correct.
18. What is the following argument an example of? "A Nobel laureate claims that high doses of vitamin C will extend your life, therefore it must be true. "
- A. Inductive reasoning
 - B. Deductive reasoning
 - C. Hypothetico-deductive reasoning
 - D. An appeal to authority.
 - E. Revealed knowledge.
19. What is the following argument an example of? "If all birds are the only animals that had feathers and Archaeopteryx had feathers than Archaeopteryx was a bird."
- A. Deductive reasoning.
 - B. Inductive reasoning.
 - C. Hypothetico-deductive reasoning.
 - D. An appeal to authority.
 - E. revealed knowledge
20. What is the following argument is an example of? "One dollar bills are green, five dollars bills are gree, ten dollar bills are green, twenty dollars bills are green, I therefore infer that all paper currency is green"
- A. Deductive reasoning.
 - B. Inductive reasoning.
 - C. An appeal to authority.
 - D. Hypothetico-deductive model of reasoning.
 - E. Revealed knowledge
- 21 .Which of the following is a potential weakness of inductive reasoning?
- A. Hasty generalizations.
 - B. Biased Sampling.
 - C. Can not prove general rules.
 - D. It is easy to get people to agree about what happened in one specific case,
 - E. A, B and C are all correct.

22 . What is parsimony?

- A. A general measure of the physical health and robustness of an individual.
- B. The principle that the simple explanation is the best explanation.
- C. A type of deductive logic
- D. The principle that evolution is irreversible.
- E. A, B and C are all correct.

23 .Who was Thomas Malthus?

- A. A French geologist who believed that species could be spontaneously created under the appropriate conditions.
- B. An American botanist who exchanged letters with Darwin about variation in plants.
- C. An Italian scientist who proposed the principle of superposition,
- D. A Hindu philosopher whose theories about the great cycle of life greatly influenced Cuvier.
- E. A British clergyman who argued that all populations have the ability to grow exponentially.

24 .Who was Charles Lyell?

- A. A geologist who argued that the earth very old.
- B. the most famous proponent of natural theology.
- C. The creator of the theory inheritance of acquired traits
- D. The chief proponent of the Catastrophism theory of geology.
- E. A, B and C are all correct.

25 Omitted

26. Who Alfred Russel Wallace?

- A. A contemporary of Charles Darwin.
- B. A British naturalist who explored many remote and isolated islands.
- C. The first scientists to have his theory natural selection presented at a public gathering of scientists.
- D. The most ardent opponent of Darwin's theories during his lifetime.
- E. A, B and C are all correct.

27 .What does "Scala Nature" mean?

- A. The process of nature selecting some individuals to survive and reproduce and discriminating against others.
- B. The idea that scales are found only on primitive organisms.
- C. A diagrammatic history of the evolution of organisms from a common ancestor. Often represented as tree, with the trunk representing a common ancestor and the branches derived species.
- D. It is a reference to the scales used by a Greek goddess to weigh the claims of different scientists. In science it is represent the idea that reason can be used to judge theories.
- E. A ranking or scale of organisms from least perfect to most perfect. Often represented as a ladder with human's on the top rung.

28 . How did Darwin's and Lamarck's theories of evolution differ?

- A. Darwin's theory was an attempt to explain how evolution could occur, Lamarck's theory was an attempt to explain why evolution could not occur.
- B. Darwin's theory predicted adaptation to local environments, Lamarck's theory predicted directional change in in preordained and progressive way forming ever higher and more advanced species.
- C. Darwin's theory assumed differential survival of individuals with different traits, Lamarck's theory assumed that all individuals survived.
- D. Darwin's theory assumed that favorable traits could only be inherited from your parents, Lamarck assumed that favorable traits could be acquired by effort during an individuals life.
- E. All of above are correct

29 . What are the three domains of life described in your text?

- A. Archea, Eukaraya, & Bacteria
- B. Land, Sea & Air
- C. Homology Analogy & Parsimony
- D. Plants, Fungi and Animals,
- E. Oxygen, Carbon & Water

30. Which of the following is a postulate of Charles Darwin's Theory of Natural Selection?

- A. Offspring will be identical to their parents.
- B. Evolution give rise to more and more perfect organisms.
- C. Each continent will have different species because of natural selection.
- D. Each individual is amazing well adapted to its environment.
- E. All species have the biotic potential to produce more offspring than the environment can support.

31. Which of these pairs are mismatched?

- A. Charles Darwin - Natural Selection
- B. Linnaeus - Classified organism by scala nature
- C. Cuvier - a series of catastrophes explains the fossil record
- D. Lamarck - Uniformitarianism
- E. All of above are correct

32. Who was Georges Cuvier?

- A. A French scientist who carefully modified all of his theories and conclusions rather than risk offending the Catholic Church.
- B. A scientist who made the most detailed and empirical studies of anatomy up to the time he died.
- C. One the first scientist to accept that species went extinct, he also played an important role in convincing the scientific community that extinctions did occur.
- D. A French scientist who argued that based on the geological record it was reasonable to conclude that a series of catastrophes had repeatedly caused mass extinctions followed by new bouts of species creation.
- E. B, C, and D are all true

33. Omitted

34. Omitted

35. Omitted

36. Which pre-Darwinian scientist described the earth's history as having "no vestige of a beginning,--no prospect of an end." ?

- A. Charles Lyell.
- B. Comte de Buffon (Georges Louis Leclerc).
- C. Nicolaus Steno.
- D. Georges Cuvier.
- E. James Hutton.

37. What does "immutable" mean?

- A. Quiet and difficult to understand.
- B. Capable of change.
- C. Likely to contain genetic defects.
- D. A species that has lost the ability to reproduce.
- E. Incapable of change.

38. Which of the following is a trait of a good scientific theory?

- A. It does not contradict what is already known.
- B. It makes predictions that can be tested.
- C. It provides a plausible explanation about how some part of the physical universe behaves.
- D. All of the above
- E. None of the above

39. Where do new scientific theories come from?

- A. They are created by imaginative scientists.
- B. They are revealed in textbooks.
- C. Appointed scientific commissions create theories by compromise and give and take.
- D. They are derived from the popular conceptions about how most people think things should work.
- E. No new theories are ever created, scientists just keep arguing about the same old ideas.

40. Omitted

41. Science can only be used to study phenomena that . . . ?

- A. Have previously been described in the scientific literature.
- B. Are controversial and exciting.
- C. Are observable and measurable.
- D. Are important only to a small group of people with nothing better to do.
- E. Can not be explained by any other method.

42. What is convergent evolution?

- A. The selection of common traits in unrelated species.
- B. An explanation of why all fast food tastes the same.
- C. A theory that evolution will converge upon the optimum solution to any trait.
- D. A theory that evolution will always cause two species to become different
- E. The inability of evolution to explain similar traits in unrelated species

43. Which of the following is a weakness of the hypothetico-deductive model of reasoning?
- A. It relies heavily on the opinions of a few respected scientists.
 - B. It is only applicable to phenomena that can be observed, measured and quantified.
 - C. It can not prove if any theory is correct or incorrect.
 - D. B and C.
 - E. It is far too difficult for the average person to understand and use.
44. Which of the following two people were born on the same day, February 12, 1809?
- A. Alfred Russel Wallace and George Washington
 - B. Charles Lyell and Charles Darwin
 - C. Cuvier and Darwin
 - D. Theodore Roosevelt and Alfred Russel Wallace
 - E. Charles Darwin and Abraham Lincoln
45. In terms of the hypothetico-deductive model of reasoning, as described in class, which of the following best describes a theory?
- A. An educated guess.
 - B. A well supported hypothesis.
 - C. A mathematically proven theorem.
 - D. A group of postulates that is tentatively accepted combine to explain an observation or group of observations.
 - E. A consensus reached by a group of scientists.
46. What year did Charles Darwin publish "On the Origin of Species"?
- A. 1776
 - B. 1823
 - C. 1859
 - D. 1901
 - E. 1976
47. Which of the following is a weakness of deductive reasoning?
- A. You can't prove anything is true with deductive reasoning.
 - B. Deductive reasoning relies upon accepting what an "authority" says is true, and authorities are liable to make mistakes.
 - C. It is difficult to derive general postulates that everyone agrees are true.
 - D. It is based on probabilities and can therefore only predict what might be true, not what is true.
 - E. Biased sampling can lead to hasty generalizations.
48. Which of the following best describes deductive reasoning?
- A. Observe specific cases and based on patterns observed, derive general rules.
 - B. Begin with generalities (postulates) that everyone agrees are true. Combine two or more generalities with "if" and "then" statements to make inferences about specific cases.
 - C. Calculate the probability that an event can occur and then infer that it really happened, if and only if the probability is high.
 - D. Consult numerous experts on the topic and then infer the most commonly accepted explanation by the experts is true.
 - E. Choices B and D.

49. What is the principle of uniformitarianism?

- A. The idea that all individuals of a species share certain uniform traits.
- B. The idea that doctors and nurses should wear uniforms so they are not confused with the patients.
- C. The theory that new species are created at constant uniform rates.
- D. Hutton's theory that there was a continuous gradient between nonliving and living organisms (i.e. uniformity in all things).
- E. The theory that the formation of mountains, valleys and other geological features could be explained by the same geological process that are occurring now had been occurring for long periods of time at near uniform rates.

50. Which of the following best describes Lamarck's theory of evolution?

- A. Inheritance of acquired traits.
- B. Limited evolution within archetypes.
- C. Evolution was an illusion created by an incomplete fossil record.
- D. Spontaneous creation of life formed new species all the time.
- E. Natural selection caused very gradual change in populations over time.

51. According to your text which of the following best summarizes LaMarck's view of the history of life?

- A. Many origins of life no extinctions
- B. Many extinctions only one origin
- C. Multiple origins, multiple extinctions
- D. Immutable species that had always existed
- E. Life originated after each catastrophe.

52. What does the word "extant" mean?

- A. smelly
- B. not extinct
- C. extinct
- D. immutable
- E. rapidly evolving

53. What is the fusion of two separate evolutionary lines called?

- A. nothing – it can't happen
- B. homology
- C. Analogy
- D. convergent evolution
- E. anastomoses