

Lesson 10 Study Guide

15. By far most of the species that have ever existed are now extinct. Many of those extinct species were the precursors of the species that are alive today. The historical evolutionary relationship between a group of related organisms is known as its:

- (A) phylogeny
- (B) gerontology
- (C) ontogeny
- (D) reflexology
- (E) teleology

16. The process of evolution is about speciation. We know that species go extinct. We also know that new species arise. Speciation is the process of how new species develop from existing ones. Speciation can occur when

- (A) Populations are geographically isolated from each other (allopatric speciation)
- (B) Populations are ecologically isolated from each other (sympatric speciation)
- (C) Wide crosses are made which become isolated from their ancestors
- (D) Mutations contribute to fertile offspring which become genetically isolated
- (E) Any and all of the answers are correct

17. Critics of evolution state that that it is not possible since it disobeys the second law of thermodynamics. The tendency of energy to dissipate as described by the second law of thermodynamics is called:

- (A) equilibrium: where everything must remain in an equal balance
- (B) entropy: where order tends to become disordered
- (C) metabolism: referring to the breakdown of sugars
- (D) endothermic: where reactions require heat
- (E) nuclear: where reactions in life occur only in atomic chain reactions

18. Birds did not evolve feathers in order to fly... anymore than they evolved feathers to fill your down comforter. Elephants did not assume their charming appearances to become circus performers. These characteristics occur as a result of variation in DNA across a population and a selection for functionality. The process of biological change therefore, can not be purposive. This indicates that:

- (A) evolution must be directed by a higher power
- (B) change in DNA occurs because of the environment
- (C) individuals do not exercise 'will' over the changes passed on to their offspring
- (D) evolution is wrong
- (E) that it is so complicated that a higher power must be involved

19. "Life is an information processing system capable of replication with variation mediated by metabolism through biochemistry in an aqueous environment and subjected to selection in the stochastic chance and necessity consequential from the big bang resulting in perceptions of beauty, knowledge, truth, love, consciousness, free will, morality, self, and life." Variation in a population can be selected for by various pressures including:

- (A) sexual selection
- (B) predation selection
- (C) physiological selection
- (D) all of these answers are correct
- (E) none of these answers are correct

20. The process of evolution in biological organisms involves:

- (A) changes that occur over time and many generations causing divergence in form and function
- (B) geographic and mating separations (language counts)
- (C) selection pressure by the environment
- (D) mutations, chromosomal rearrangements and other changes to DNA
- (E) all of these factors are involved

21. Ken Miller:

- (A) supports the idea that ID should be taught in biology as an alternative to evolution
- (B) thinks that biological life is static and unchangeable
- (C) plays short stop for the Boston Red Sox
- (D) is an expert on evolution and education
- (E) is disconcerted about his relationship between Faith and Evolution

22. To establish that evolution by natural selection is operating in a population, one must demonstrate variability for a trait, heritability of that trait, differential reproductive success based on that trait, and:

- (A) increased complexity of the organism
- (B) random mating
- (C) progress
- (D) continuous change in the environment
- (E) nothing else

23. Evolution is:

- (A) just a theory, as a whim, an idea, or someone's guess about biology and life's origin and should not be taught in public schools without further verification or in exclusion to other ideas
- (B) limited as a concept to only Darwin's idea to explain the origin of life on earth
- (C) a process by which all biological organisms change
- (D) a clear contradiction to all known religions
- (E) an idea that needs further substantiation

24. "Survival of the fittest" may be a misleading phrase to describe the process of evolution by natural selection because:

- (A) it is impossible to determine the fittest individuals in nature
- (B) survival matters less to natural selection than reproductive success does
- (C) natural variation in a population is too great to be influenced by differential reproductive success
- (D) fitness has little to do with natural selection
- (E) reproductive success on its own does not necessarily guarantee evolution

25. Charles Darwin reached following conclusions: (1) Variation exists in natural populations. (2) Many more offspring are born each season than can possibly survive to maturity. (3) As a result, there is a struggle for existence. (4) Characteristics beneficial in the struggle for existence will tend to become more common in the population, changing the characteristics of a species. (5) Over time, and given a steady input of new variation into a population, these processes lead to the emergence of new species. These conclusions, from the Origin of Species, was coupled with:

- (A) extinction of species
- (B) supernatural consequences
- (C) Intelligent Design
- (D) natural selection
- (E) all of these answers are correct

26. Recently, several US courts have ruled against the teaching of Intelligent Design in biology classes in public schools because:

- (A) they are comprised of atheistic anti-Christian liberal zealots that have voted to support that platform in spite of the vast number of peer-reviewed papers that support Intelligent Design
- (B) Intelligent Design and other proposed alternative explanations cannot be supported by current scientific methods
- (C) the teaching of evolution was ruled to be unethical and invalid
- (D) their lobbyist was Jack Abermoff
- (E) opposition from the Church of the Flying Spaghetti Monster and many others who would want to espouse their own alternative theories

27. Which of the following is NOT an observation or inference on which Darwin's theory of natural selection is based?

- (A) there is heritable variation among individuals
- (B) poorly adapted individuals never produce offspring
- (C) because excessive numbers of offspring are produced, there is a competition for limited resources
- (D) individuals whose inherited traits best fit them to the environment
- (E) that individuals always adapt themselves to the environment and these then traits are inherited

28. A National discussion had developed about the teaching in public schools of an alternative explanation, to evolution, for biological diversity called Intelligent Design. This idea suggests that that the world ecology and biology is so complex that this infers that there must be a creator much the same way that the complexity of a watch infers a watchmaker. Intelligent Design:

- (A) is a theory that is well supported by peer-reviewed scientific evidence
- (B) is currently a well-established, evidence-based alternative to theories of evolution and natural selection
- (C) is not currently a well-established, evidence-based alternative to theories of evolution by natural selection
- (D) has been determined by the Supreme Court as material that should be taught in public schools along with other theories of origin including all worldwide mythologies and religions
- (E) has been proven quantitatively in the laboratory in repeated experiments

29. The process of evolution is a consistent pattern for life on earth. As a law of nature we might say that "Given life, there will be change." Evolution:

- (A) occurs so slowly to be observed in nature
- (B) can occur in the wild but not in the laboratory
- (C) is responsible for increased occurrence of antibiotic resistant bacteria
- (D) does not occur in human occupied habitats
- (E) none of these statements is correct

30. Genomes have now been sequenced, Genes have been cloned and moved from one species to another. Stem cells can develop into sperm cells. The development of Biotechnology:

- (A) provides substantial molecular evidence the Theory of Evolution
- (B) has been banned in Europe by governments in the EU
- (C) has therefore disproven the Theory of Evolution
- (D) is destroying evidence based medicine as we know it by supporting alternative treatments
- (E) has proven the need to teach Intelligent Design concepts in public schools