

CHAPTER 14 EVOLUTION

1. **What is the primary mechanism of evolution proposed by Charles Darwin?**
 - a) **Genetic drift**
 - b) **Mutation**
 - c) **Natural selection**
 - d) **Gene flow**
2. **Which concept explains the gradual changes in species over time?**
 - a) **Punctuated equilibrium**
 - b) **Gradualism**
 - c) **Catastrophism**
 - d) **Genetic drift**
3. **What is the term for the variety of different forms of a gene?**
 - a) **Allele**
 - b) **Phenotype**
 - c) **Genotype**
 - d) **Locus**
4. **Which of the following is a type of evidence for evolution?**
 - a) **Fossil records**
 - b) **Artificial selection**
 - c) **Comparative anatomy**
 - d) **All of the above**
5. **What does the term "fitness" refer to in evolutionary biology?**
 - a) **Physical strength**
 - b) **Ability to survive and reproduce**
 - c) **Longevity**
 - d) **Size and strength**
6. **Which scientist independently developed a theory of natural selection similar to Darwin's?**
 - a) **Gregor Mendel**
 - b) **Alfred Russel Wallace**

- c) Jean-Baptiste Lamarck
 - d) Charles Lyell
7. What is the term for the formation of new species through evolution?
- a) Speciation
 - b) Extinction
 - c) Migration
 - d) Adaptation
8. Which of the following is an example of a vestigial structure?
- a) Human arm
 - b) Whale pelvis
 - c) Bird wing
 - d) Insect wing
9. What is the concept of "descent with modification"?
- a) Species do not change over time
 - b) All species are unrelated
 - c) New species arise from existing species through changes over time
 - d) Species do not interbreed
10. Which process involves the transfer of genes between populations?
- a) Genetic drift
 - b) Mutation
 - c) Gene flow
 - d) Natural selection
11. What is the main idea of Lamarck's theory of evolution?
- a) Natural selection
 - b) Inheritance of acquired traits
 - c) Genetic mutation
 - d) Catastrophism
12. What type of evolution results in similar traits in unrelated species due to similar environmental pressures?
- a) Convergent evolution
 - b) Divergent evolution
 - c) Parallel evolution

- d) Co-evolution
13. Which of the following is an example of divergent evolution?
- a) Development of wings in bats and insects
 - b) Development of similar body shapes in dolphins and sharks
 - c) Development of different beak sizes in Darwin's finches
 - d) Symbiosis between bees and flowers
14. What are homologous structures?
- a) Structures with different origins but similar functions
 - b) Structures with a common evolutionary origin
 - c) Structures that have no functional role
 - d) Structures that develop due to environmental factors
15. What is an example of a biochemical evidence supporting evolution?
- a) Comparative anatomy
 - b) Fossil records
 - c) DNA and protein similarities
 - d) Biogeography
16. Which term describes the gradual accumulation of small genetic changes in a population?
- a) Punctuated equilibrium
 - b) Gradualism
 - c) Genetic drift
 - d) Gene flow
17. What is the primary source of genetic variation in a population?
- a) Natural selection
 - b) Mutation
 - c) Gene flow
 - d) Genetic drift
18. Which concept suggests that evolutionary change occurs rapidly in short bursts followed by long periods of stability?
- a) Gradualism
 - b) Punctuated equilibrium

- c) Stabilizing selection
 - d) Directional selection
19. What is the term for the random change in allele frequencies in a population due to chance events?
- a) Gene flow
 - b) Genetic drift
 - c) Natural selection
 - d) Mutation
20. Which type of selection favors extreme phenotypes over intermediate ones?
- a) Stabilizing selection
 - b) Directional selection
 - c) Disruptive selection
 - d) Artificial selection
21. Which term describes the appearance of new traits in a population due to changes in the environment?
- a) Mutation
 - b) Adaptation
 - c) Speciation
 - d) Genetic drift
22. What is the role of genetic mutations in evolution?
- a) They introduce new alleles into a population
 - b) They decrease genetic diversity
 - c) They eliminate deleterious traits
 - d) They maintain genetic equilibrium
23. Which of the following is an example of adaptive radiation?
- a) Darwin's finches on the Galápagos Islands
 - b) The development of antibiotic resistance in bacteria
 - c) The extinction of dinosaurs
 - d) The spread of a new disease
24. What is the term for a trait that is advantageous in a particular environment and

becomes more common in the population?

- a) Neutral trait
- b) Adaptation
- c) Vestigial trait
- d) Genetic drift

25. Which type of evolution occurs when two or more species reciprocally affect each other's evolution?

- a) Co-evolution
- b) Convergent evolution
- c) Divergent evolution
- d) Parallel evolution

26. What does the term "biogeography" refer to in the context of evolution?

- a) The study of the distribution of species and ecosystems in geographic space
- b) The study of the molecular basis of evolution
- c) The study of fossil records
- d) The study of evolutionary development of traits

27. Which term describes the evolutionary change that results in the emergence of new species?

- a) Extinction
- b) Speciation
- c) Migration
- d) Adaptation

28. What does the "modern synthesis" of evolutionary theory combine?

- a) Darwinian natural selection with Mendelian genetics
- b) Lamarckian evolution with modern genetics
- c) Punctuated equilibrium with biochemical evidence
- d) Genetic drift with ecological studies

29. What is the main idea behind the theory of punctuated equilibrium?

- a) Evolution occurs slowly and steadily over time
- b) Evolution happens in rapid bursts followed by long periods of stability
- c) Evolution is driven by genetic mutations alone

- d) Evolution results in gradual changes without interruptions
30. Which of the following is an example of an evolutionary vestige?
- a) Whale fins
 - b) Human appendix
 - c) Bird beaks
 - d) Insect wings
31. What type of evolution is observed when species with different evolutionary origins develop similar traits?
- a) Divergent evolution
 - b) Convergent evolution
 - c) Co-evolution
 - d) Parallel evolution
32. Which of the following provides the strongest evidence for common ancestry among species? Similarities in DNA sequences
- a) Similarities in body size
 - b) Similarities in habitat
 - c) Similarities in diet
 - d) Similarities in DNA sequences
33. Which of the following is an example of sexual selection?
- a) Bright plumage in peacocks
 - b) The camouflage of moths
 - c) The thick shells of turtles
 - d) The long necks of giraffes
34. What is the term for a trait that provides no significant advantage or disadvantage in the evolutionary process?
- a) Neutral trait
 - b) Adaptation
 - c) Vestigial trait
 - d) Derived trait
35. What is the purpose of studying comparative embryology in evolutionary biology?
- a) To understand the genetic basis of evolution

- b) To analyze the developmental stages of different species
 - c) To study fossil records
 - d) To investigate the biochemical similarities among species
36. Which term describes the gradual changes that occur in the structure and function of a species over long periods?
- a) Evolutionary stasis
 - b) Punctuated equilibrium
 - c) Gradualism
 - d) Natural selection
37. Which of the following can lead to a rapid change in allele frequencies within a population?
- a) Genetic drift
 - b) Gene flow
 - c) Natural selection
 - d) Mutation
38. What is the term for the phenomenon where a small population becomes isolated and evolves differently from the original population?
- a) Founder effect
 - b) Bottleneck effect
 - c) Gene flow
 - d) Stabilizing selection
39. Which of the following is an example of convergent evolution?
- a) The development of wings in bats and birds
 - b) The development of different beak sizes in Darwin's finches
 - c) The evolution of lactose tolerance in humans
 - d) The appearance of similar traits in species with a common ancestor
40. What is the primary focus of phylogenetics?
- a) Studying the physical characteristics of organisms
 - b) Analyzing the evolutionary relationships between species
 - c) Investigating the geographical distribution of species
 - d) Examining the fossil record

41. Which process can lead to the emergence of new traits that are beneficial in a specific environment?
- a) Genetic drift
 - b) Gene flow
 - c) Natural selection
 - d) Mutation
42. Which of the following provides evidence for the theory of evolution based on molecular data?
- a) Similarities in anatomical structures
 - b) Fossil records
 - c) Comparative DNA and protein sequences
 - d) Biogeographical patterns
43. What does the term "adaptive radiation" refer to?
- a) The evolution of a single lineage into a variety of forms adapted to different environments
 - b) The spread of a trait through a population
 - c) The gradual evolution of a species
 - d) The extinction of a species
44. Which of the following is an example of directional selection?
- a) The increase in size of antibiotic-resistant bacteria
 - b) The variation in beak sizes among Darwin's finches
 - c) The variation in coat color in peppered moths
 - d) The increase in size of the largest individuals in a population
45. What is the primary role of fossils in studying evolution?
- a) To provide evidence for the timeline of evolutionary changes
 - b) To demonstrate the biochemical similarities between species
 - c) To illustrate the geographical distribution of species
 - d) To explain the mechanisms of genetic inheritance
46. What is the term for a population's ability to adapt to changing environmental conditions over time?
- a) Genetic drift

- b) Evolutionary fitness
- c) Adaptive evolution
- d) Genetic equilibrium

47. Which evolutionary concept suggests that evolutionary change is often triggered by major environmental changes or catastrophes?

- a) Punctuated equilibrium
- b) Gradualism
- c) Genetic drift
- d) Natural selection

48. What is the term for the process by which two species evolve in response to each other?

- a) Co-evolution
- b) Convergent evolution
- c) Divergent evolution
- d) Parallel evolution

49. Which of the following best describes the concept of "survival of the fittest"?

- a) The strongest individuals in a population will always survive
- b) The most adaptable individuals to their environment will have a higher reproductive success
- c) The largest individuals will have the most offspring
- d) The individuals with the most resources will survive

50. What is the main role of the gene pool in evolutionary theory?

- a) To determine the genetic makeup of a population
- b) To track the history of species
- c) To identify the anatomical similarities between species
- d) To describe the geographical distribution of species

Answer key

1	2	3	4	5
C	B	A	D	B
6	7	8	9	10
B	A	B	C	C
11	12	13	14	15
B	A	C	B	C
16	17	18	19	20
B	B	B	B	C
21	22	23	24	25
B	A	A	B	A
26	27	28	29	30
A	B	A	B	B
31	32	33	34	35
B	A	A	A	B
36	37	38	39	40
C	C	A	A	B
41	42	43	44	45
C	C	A	A	A
46	47	48	49	50
C	A	A	B	A