MCQ on Evolution

Evolution is the process by which species of organisms change over time through variations in their genetic traits. These changes occur due to mechanisms such as mutation, natural selection, and genetic drift, leading to the adaptation of species to their environments. Over long periods, evolution can result in the emergence of new species from common ancestors. The theory of evolution, first widely popularized by Charles Darwin, provides a scientific explanation for the diversity of life on Earth. This is an MCQ on Evolution with Answer Key and Explanations. You can download these MCQ set as PDF from the download link provided below the post.

(1). Which of the following scientists proposed the theory of natural selection?

(a). Jean-Baptiste Lamarck

(b). Charles Darwin

(c). Alfred Russel Wallace

(d). Gregor Mendel

(2). The Hardy-Weinberg equilibrium is based on all of the following assumptions except:

(a). No mutation

(b). Random mating

(c). Small population size

(d). No natural selection

(3). Which of the following is an example of genetic drift?

(a). Natural selection

(b). Founder effect

(c). Gene flow

(d). Mutation

(4). Homologous structures in different organisms are evidence of:

(a). Divergent evolution

(b). Convergent evolution

(c). Co-evolution

(d). Genetic drift

(5). Which of the following is a vestigial structure in humans?

(a). Appendix

(b). Heart

(c). Lungs

(d). Kidneys

(6). The primary mechanism by which new genetic material is introduced into a population is:

(a). Gene flow

(b). Mutation

(c). Genetic drift

(d). Natural selection

(7). Which of the following terms describes the process by which unrelated species evolve similar traits?

(a). Divergent evolution

(b). Convergent evolution

(c). Adaptive radiation

(d). Genetic drift

(8). The concept of "survival of the fittest" is most closely associated with:

(a). Lamarckism

(b). Darwinism

(c). Mendelian inheritance

(d). Punctuated equilibrium

(9). In a population that is in Hardy-Weinberg equilibrium, the frequency of the dominant allele is 0.7. What is the frequency of the recessive allele?

(a). 0.3

(b). 0.5

(c). 0.7

(d). 0.9

(10). Which of the following best describes allopatric speciation?

(a). Speciation without geographical isolation

(b). Speciation due to hybridization

(c). Speciation due to geographical isolation

(d). Speciation within the same habitat

(11). In which era did the first multicellular organisms appear?

(a). Precambrian

(b). Paleozoic

(c). Mesozoic

(d). Cenozoic

(12). Which of the following mechanisms leads to an increase in genetic diversity within a population?

(a). Genetic drift

(b). Natural selection

(c). Mutation

(d). Bottleneck effect

(13). The bottleneck effect is an example of:

(a). Natural selection

(b). Genetic drift

(c). Gene flow

(d). Sexual selection

(14). Which type of selection favors the intermediate phenotype?

(a). Disruptive selection

(b). Directional selection

(c). Stabilizing selection

(d). Artificial selection

(15). The Cambrian explosion is significant because it:

(a). Marks the extinction of the dinosaurs

(b). Marks the appearance of a large number of diverse animal forms

(c). Represents the time when life first appeared on Earth

(d). Marks the transition from unicellular to multicellular life

(16). Adaptive radiation is most likely to occur when:

(a). A species colonizes a new habitat with few competitors

(b). A population undergoes genetic drift

(c). A population is in Hardy-Weinberg equilibrium

(d). A population experiences a bottleneck effect

(17). Which of the following is a correct statement about the fossil record?

(a). It shows that most species have remained unchanged over time

(b). It shows that life has existed on Earth for only a short time

(c). It provides evidence for the common ancestry of life

(d). It shows that evolution occurs at a constant rate

(18). Which of the following is an example of co-evolution?

(a). Birds and bats developing wings independently

(b). Bees and flowers developing mutually beneficial traits

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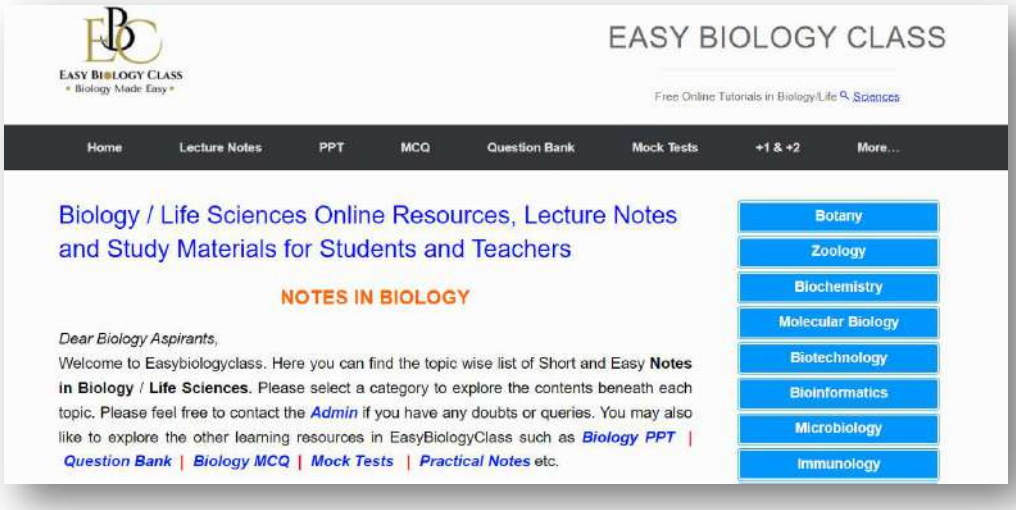

(c). Dolphins and fish developing similar body shapes

(d). A species of lizard changing color to blend into its environment

(19). The term "punctuated equilibrium" refers to:

(a). Gradual evolutionary change

(b). Long periods of stability interrupted by brief periods of rapid change

(c). The steady accumulation of small genetic changes

(d). The equilibrium of allele frequencies in a population

(20). Which of the following is an example of sexual selection?

(a). Brightly colored feathers in male peacocks

(b). Camouflage in moths

(c). Large size in elephants

(d). Strong wings in birds of prey

(21). The endosymbiotic theory explains the origin of:

(a). Chloroplasts and mitochondria

(b). The nucleus

(c). Ribosomes

(d). The cell membrane

(22). Which of the following structures is not homologous?

(a). Human arm and bat wing

(b). Shark fin and dolphin flipper

(c). Cat paw and human hand

(d). Whale flipper and bat wing

(23). Which of the following best explains the concept of genetic drift?

(a). A random change in allele frequencies in a small population

(b). The movement of alleles between populations

(c). The creation of new alleles through mutation

(d). The selection of beneficial traits in a population

(24). Which of the following statements is true about Lamarck's theory of evolution?

(a). It suggests that acquired characteristics can be inherited

(b). It is based on the concept of natural selection

(c). It is the foundation of modern evolutionary biology

(d). It proposes that evolution is driven by random mutations

(25). The "Modern Synthesis" of evolutionary biology combines Darwin's theory of natural selection with:

(a). Mendelian genetics

(b). Lamarckism

(c). Punctuated equilibrium

(d). Catastrophism

Answer Key

(1). (b). Charles Darwin

Darwin is credited with the development of the theory of natural selection.

(2). (c). Small population size

Hardy-Weinberg equilibrium assumes a large population size to prevent genetic drift.

(3). (b). Founder effect

Genetic drift occurs when a small group of individuals forms a new population.

(4). (a). Divergent evolution

Homologous structures arise from a common ancestor and indicate divergent evolution.

(5). (a). Appendix

The appendix is a vestigial structure, a remnant of an organ that had a function in ancestors.

(6). (b). Mutation

Mutations introduce new genetic material into a population, driving evolution.

(7). (b). Convergent evolution

Convergent evolution occurs when unrelated species develop similar traits due to similar environmental pressures.

(8). (b). Darwinism

Survival of the fittest is a concept central to Darwin's theory of natural selection.

(9). (a). 0.3

If the frequency of the dominant allele is 0.7, the recessive allele's frequency is 1 - 0.7 = 0.3.

(10). (c). Speciation due to geographical isolation

Allopatric speciation occurs when populations are geographically isolated and evolve independently.

(11). (a). Precambrian

The first multicellular organisms appeared during the Precambrian era.

(12). (c). Mutation

Mutations increase genetic diversity by introducing new alleles into the population.

(13). (b). Genetic drift

The bottleneck effect is a form of genetic drift that occurs when a population's size is significantly reduced.

(14). (c). Stabilizing selection

Stabilizing selection favors the intermediate phenotype, reducing variation in a trait.

(15). (b). Marks the appearance of a large number of diverse animal forms

The Cambrian explosion saw the rapid emergence of a wide variety of complex organisms.

(16). (a). A species colonizes a new habitat with few competitors

Adaptive radiation occurs when a species quickly diversifies to fill available ecological niches.

(17). (c). It provides evidence for the common ancestry of life

The fossil record shows patterns that suggest all life shares a common ancestor.

(18). (b). Bees and flowers developing mutually beneficial traits

Co-evolution involves two species evolving traits in response to each other.

(19). (b). Long periods of stability interrupted by brief periods of rapid change

Punctuated equilibrium describes a pattern of evolutionary change in which long periods of stability are punctuated by short bursts of rapid evolution.

(20). (a). Brightly colored feathers in male peacocks

Sexual selection is a form of natural selection where traits that increase an individual's chance of mating are favored.

(21). (a). Chloroplasts and mitochondria

The endosymbiotic theory explains the origin of organelles like chloroplasts and mitochondria in eukaryotic cells.

(22). (b). Shark fin and dolphin flipper

Shark fins and dolphin flippers are analogous structures, not homologous, as they did not arise from a common ancestor.

(23). (a). A random change in allele frequencies in a small population

Genetic drift refers to random fluctuations in allele frequencies, especially in small populations.

(24). (a). It suggests that acquired characteristics can be inherited

Lamarck's theory proposed that traits acquired during an organism's life could be passed on to its offspring.

(25). (a). Mendelian genetics

The Modern Synthesis combines Darwinian evolution with Mendelian genetics, forming the foundation of contemporary evolutionary biology.