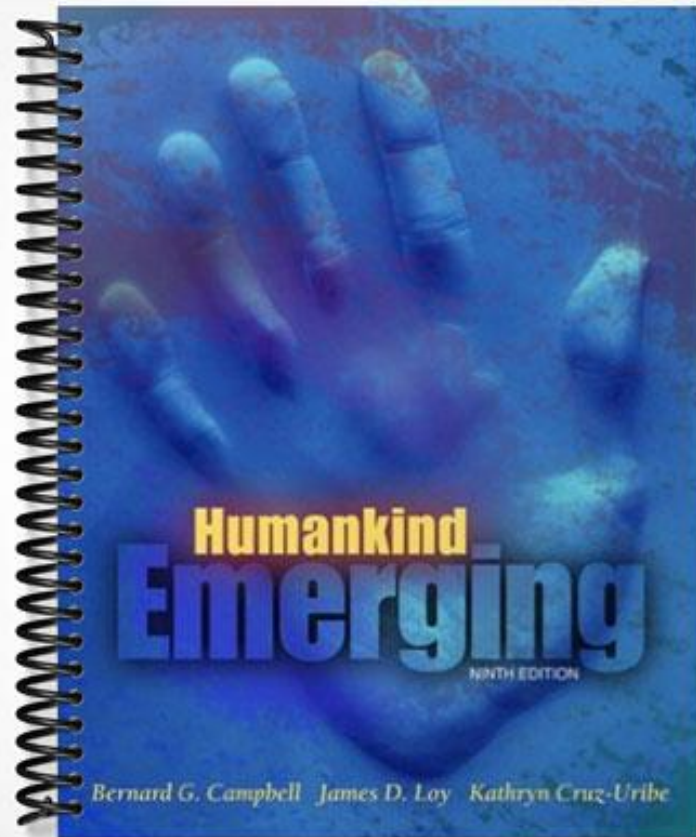


TEST BANK



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Chapter 1 The Search for Human Origins

Multiple Choice Questions

1) Archbishop James Ussher calculated the year of the earth's creations as

- A) 4004 B.C.
- B) 10,000 B.C.
- C) 5-7 million years ago
- D) 4.5 billion years ago
- E) 6,500 B. C.

Answer: A

2) Early naturalist John Ray explained the presence of marine fossils high on top of mountains as

- A) divine whimsy
- B) the result of human disturbance
- C) the result of deposition after the Biblical Flood
- D) the result of uniformitarian processes
- E) the result of volcanic action

Answer: C

3) The first person to attempt to prove systematically that chipped stones from European sites were human artifacts was

- A) Charles Darwin
- B) Boucher de Perthes
- C) T. H. Huxley
- D) Charles Lyell
- E) James Hutton

Answer: B

4) Which of the following naturalists provided important proof of the concept of "deep time" (ancient formation of the earth)?

- A) A. R. Wallace
- B) Charles Lyell
- C) T.H. Huxley
- D) T. R. Malthus
- E) William Buckland

Answer: B

- 5) Georges Cuvier's theory explaining changes in animal life throughout the earth's history is called
- A) historicalism
 - B) faunal development theory
 - C) catastrophism
 - D) Cuvierism
 - E) gradualism

Answer: C

- 6) The use of fossils as historical markers in the geological record can be traced back to
- A) Charles Darwin's evolutionary model as presented in *On the Origin of Species*
 - B) John Ray's studies of flood-based extinctions
 - C) Charles Lyell's theory of progressive evolutionary change
 - D) Georges Cuvier's proof of the extinction of species
 - E) Lamarck's use of fossil similarities over time

Answer: D

- 7) Which of the following persons co-discovered (along with Charles Darwin) the evolutionary mechanism of natural selection?
- A) A. R. Wallace
 - B) J. B. Lamarck
 - C) Georges Cuvier
 - D) T. H. Huxley
 - E) Hugh Falconer

Answer: A

- 8) In his pronouncement about the Uniformity of State, Charles Lyell claimed that
- A) in the past, the world was shaped by processes very different from those in operation today
 - B) natural laws have varied throughout space and time, and those in operation today are of recent origin
 - C) change is continuous, but non-progressive and non-directional
 - D) change generally occurs in catastrophic spurts after long periods of stability
 - E) gradual change over time can make only small changes in landforms

Answer: C

- 9) Lyellian "uniformitarianism" was applied to organic evolution by
- A) Charles Lyell himself
 - B) Charles Darwin
 - C) J. B. Lamarck
 - D) James Hutton
 - E) Pierre Boucher de Perthes

Answer: B

- 10) Which set of items is most closely associated with the views of J. B. Lamarck?
- A) "needs" recognized by animals; inheritance of acquired characteristics
 - B) species immutability; organic evolution organisms adapting to their environment
 - C) environmental effects on organisms; creationism; the application of Darwinian theory
 - D) stable environments; anti-evolutionist views; catastrophism
 - E) extinction, species immutability, natural selection

Answer: A

- 11) T. R. Malthus's *Essay on the Principle of Population* caused both C. Darwin and A. R. Wallace to realize the importance of
- A) unrestrained population growth and the lack of differential survival among the members of a species
 - B) the Biblical account of creation and variations in anatomy among the members of a species
 - C) humans' divine origin and the Lamarckian principle of the inheritance of acquired traits
 - D) competition within each animal population and differences in individuals' adaptations to their environment
 - E) instinctive population control on the part of species

Answer: D

- 12) Which of the following statements best describes the evolutionary model presented by C. Darwin in *On the Origin of Species*?
- A) within every population there is competition. Those animals that refrain from competing will have greater rates of survival and reproduction than more aggressive individuals.
 - B) the members of any species vary among themselves and may be viewed as in competition with one another. Individuals possessing adaptive traits (one that aid in this competition) will survive and reproduce. Over time, the adaptive traits will spread within the species.
 - C) organisms generally produce fewer offspring than the environment can support. Evolution then acts to increase the reproductive success of all members of a species equally.
 - D) organisms generally practice reproductive restraint. This allows all members of a species to be uniform in their traits. Changes in species (evolution) may be attributed to periodic divine intervention.
 - E) two or more physical types exist within species, one of which will ultimately prove to be fittest.

Answer: B

- 13) In C. Darwin's view, evolutionary change proceeded
- A) according to Lyell's principle of Uniformity of Rate
 - B) intermittently and rapidly
 - C) without any loss of life among living organisms
 - D) with a view toward adapting organisms to future environments
 - E) according to the speed of environmental change, generally a rapid rate

Answer: A

- 14) The anatomical work of T. H. Huxley
- A) established the fact that species go extinct
 - B) proved that humans were created in their present form 6000 years ago
 - C) showed that human's closest evolutionary relatives are the apes
 - D) provided strong evidence against the evolutionary development of humans
 - E) showed that there were several subspecies of humans

Answer: C

- 15) C. Darwin's book *On the Origin of Species*
- A) presented a convincing case for human evolution
 - B) summarized all of the fossil evidence for human evolution
 - C) ignored the enormous number of human fossils known in 1859
 - D) said almost nothing about human origins and, indeed, was published before there was much evidence of fossil humans
 - E) exempted humans from the rules of evolution in order to avoid offending readers

Answer: D

- 16) The theory of inheritance common in the late 1800's was
- A) particulate inheritance
 - B) Mendelian genetics
 - C) mutational inheritance
 - D) blending inheritance
 - E) decay from Platonic forms

Answer: D

- 17) The hereditary information of an individual constitutes it
- A) genotype
 - B) mutotype
 - C) hybridotype
 - D) phenotype
 - E) physiology

Answer: A

- 18) Which of the following scientists rediscovered Mendel's work in 1900?
- A) Ronald Fisher
 - B) Sewall Wright
 - C) Hugo De Vries
 - D) J. B. S. Haldane
 - E) Davidson Black

Answer: C

- 19) The garden pea breeding studies of G. Mendel
- A) brought him fame as a scientist during his lifetime
 - B) have been completely disproved by modern geneticists
 - C) were important in helping C. Darwin
 - D) went almost unnoticed for over 30 years
 - E) were less successful than his later experiments

Answer: D

- 20) Ronald Fisher's mathematical analyses showed that
- A) mimics could be matched to models only through mutations
 - B) Mendel's *Principle of Segregation* was in error
 - C) natural selection acting on small variations could match mimic to model
 - D) mutations have little effect on genetic variance in a species
 - E) variation within populations disappears over time

Answer: C

- 21) Hugo De Vries
- A) took the honorable action when he copied the experiments of G. Mendel and published the results without giving credit to G. Mendel
 - B) took the honorable action when he called attention to the rediscovered work G. Mendel
 - C) took the honorable action when he republished the experiments of G. Mendel under his own name
 - D) took the honorable action when he ignored the rediscovered experiments of G. Mendel and carried out similar research on another species
 - E) took the honorable action when he published errors in Mendel's work despite their long friendship

Answer: B

- 22) Which of the following genotypes would be considered homozygous recessive?
- A) AA B) AaBb C) BB D) aa E) AABB

Answer: D

- 23) Following Mendel's *Principle of Segregation*, gametes (sperm and ova) contain
- A) a blended genotype
 - B) twice as much genetic material as a body cell
 - C) one-half of a complete genotype
 - D) a complete genotype
 - E) none of the above

Answer: C

- 24) Following Mendel's *Principle of Independent Assortment*, hereditary units
- A) are blended during long association in heterozygous individuals
 - B) remain distinct during long association in an individual
 - C) are the result of independent mutation in each individual
 - D) are blended during long association in an individual
 - E) blend only in homozygous individuals

Answer: B

- 25) The synthetic theory of evolution or the modern synthesis
- A) was first proposed by C. Darwin
 - B) are phrases based on the title of a book by J. Huxley
 - C) was proposed by R. Fisher
 - D) no longer guides the work of biologists
 - E) was proposed by Alfred Russel Wallace

Answer: B

True/False Questions

- 26) Before the development of evolutionary theory, European thinking regarding human origins was shaped mainly by the Genesis story of creation.

Answer: TRUE

- 27) Paleoanthropological field work is generally done by lone fossil-hunters. Interdisciplinary collaboration has yet to develop within paleoanthropology.

Answer: FALSE

- 28) Creation Science meets all of the criteria of true scientific investigation: hypothesis generation, hypothesis testing, and theory modification.

Answer: FALSE

- 29) The date for the origin of the earth of 4004 BC is written in Genesis as part of the revealed word of God.

Answer: FALSE

- 30) It was not until the 1800's that stone tools were taken as serious evidence of ancient humans.

Answer: FALSE

- 31) The natural selection of was presented as process by which adaptive traits are preserved and less adaptive traits are winnowed out of species.

Answer: TRUE

- 32) Darwin applied the principles of catastrophist of Georges Cuvier to his ideas of evolutionary theory.

Answer: FALSE

33) Darwin was forthcoming in *Origin of Species* of the application of natural selection to the origin of humans.

Answer: FALSE

34) In 1863 T. H. Huxley published evidence that humans and apes are similar in their anatomies and humans are likely to have descended from ape ancestors.

Answer: TRUE

35) Gregor Mendel chose the garden pea for his breeding experiments because it was true-breeding and had several easily observed pairs of traits.

Answer: TRUE

36) The garden pea turned out to be a poor choice for genetic experiments for Mendel

Answer: FALSE

37) Recessive traits are only expressed in heterozygous pairs

Answer: FALSE

38) During the first three decades of the 20th century, biologists viewed Mendelian genetics as a competitor to the theory of evolution.

Answer: TRUE

39) Cuvier and Lamarck were rivals with competing explanations for the fossil record throughout their careers

Answer: TRUE

40) Darwin was greatly influence by Lyell and Malthus when forming the theory of evolution

Answer: TRUE

41) strict Darwinian evolution is also known as gradualism

Answer: TRUE

Short Answer Questions

42) Phenotypic traits produced by _____ may disappear for a generation, only to reappear later.

Answer: recessive genes

43) Crossing two heterozygous individuals (Aa X Aa) can produce _____ genotypic conditions in the offspring.

Answer: three

44) The writings of Charles Darwin were inspired by a book by _____.

Answer: T. Malthus

- 45) _____ developed the binomial system of classifying plants and animals.
Answer: Linnaeus
- 46) _____ acted ethically when he called attention to the earlier work of Gregor Mendel.
Answer: Hugo De Vries
- 47) Mathematical analyses proved that mimics in nature could be produced by the action of _____.
Answer: Natural Selection
- 48) For evolution to occur, both _____ and _____ are necessary.
Answer: mutation; natural selection
- 49) According to the _____ offspring are equally related to both parents in sexually reproducing species.
Answer: Principle of Segregation
- 50) _____ disproved the notion that inheritance is a process of blending inheritance.
Answer: Gregor Mendel
- 51) _____ is the view that the appearance of more modern forms can be explained by a series of disasters.
Answer: Catastrophism

Essay Questions

- 52) Describe the key events in the development of "deep time." Explain why this concept was of such importance for the later development of evolutionary theory.
- 53) What role did Malthus play in the thinking of Darwin and Wallace?
- 54) In his experiments with the garden pea, Mendel discovered the laws of heredity. What are the laws of heredity and what role did the discovery of Mendel's earlier research play in the development of evolutionary theory in the 20th century.
- 55) Describe the Darwin/Wallace theory of evolution by natural selection. Explain how this theory differs from the evolutionary model presented by Lamarck.
- 56) Compare and contrast the catastrophist views of Georges Cuvier with the uniformitarian views of Charles Lyell.

Chapter 2 Evolutionary Mechanisms

Multiple Choice Questions

- 1) Most genes are located in the nucleus of the cell, but a few are found in the:
- A) chromosomes
 - B) spindle
 - C) mitochondria
 - D) chiasmata
 - E) vacuoles

Answer: C

- 2) Variant forms of a particular gene are called:
- A) hereditary variants
 - B) alleles
 - C) gene morphs
 - D) subgenes
 - E) adaptive variation

Answer: B

- 3) Structural genes are involved in such features as:
- A) eye color and susceptibility to certain diseases
 - B) skin color and metabolism
 - C) energetic and biosynthetic activities of the body
 - D) susceptibility to certain diseases and metabolism
 - E) lifespan and body weight

Answer: A

- 4) Meiosis results in
- A) haploid gametes
 - B) diploid gametes
 - C) diploid somatic cells
 - D) haploid somatic cells
 - E) none of the above

Answer: C

- 5) Codons
- A) are three adjacent nucleotide bases
 - B) code for the production of particular amino acids
 - C) contribute to protein synthesis
 - D) all of the above
 - E) none of the above

Answer: D

- 6) Not all DNA codes for protein production. Noncoding portions are called
- A) intron sequences
 - B) exon sequences
 - C) blank DNA
 - D) messenger DNA
 - E) reserve DNA

Answer: A

- 7) Somatic cells
- A) contain homologous chromosomes
 - B) have a haploid number of chromosomes
 - C) lack sex chromosomes
 - D) contain fewer mitochondria
 - E) all of the above

Answer: A

- 8) Person who carried out research important to the discovery of the composition and structure of DNA
- A) Friedrich Miescher
 - B) Hugo de Vries
 - C) Rosalind Franklin
 - D) Ernst Mayr
 - E) John Ridley

Answer: C

- 9) Regulatory genes control such features as
- A) eye color and limb length
 - B) metabolic and biosynthetic activities of the body
 - C) metabolism and susceptibility to certain diseases
 - D) skin and hair color
 - E) none of the above

Answer: B

10) Point mutations

- A) usually involve a doubling of the DNA at a particular locus
- B) usually involve increasing or decreasing the chromosome number
- C) usually involve spontaneous changes in a gene's DNA
- D) only occur under experimental conditions
- E) only occur in junk DNA

Answer: C

11) The term heritability refers to:

- A) the degree of similarity between parent and child
- B) the proportion of a phenotypic trait's variance that is attributable to genetic variance between individuals
- C) the proportion of a population's total phenotypic variation that is attributable to the effects of the environment
- D) the average phenotypic change between succeeding generations
- E) those phenotypic traits that are immune to environmental influences

Answer: B

12) The total genetic material in a breeding population is called the

- A) population genotype
- B) genetic drift
- C) dual inheritance
- D) gene pool
- E) deme

Answer: D

13) Which list best describes gene flow?

- A) often accomplished by emigration; aids in the reproductive isolation of populations
- B) leads to speciation; refers to breeding within a population
- C) often works to prevent or reduce reproductive isolation between populations; promotes genetic similarity between populations
- D) a form of natural selection; generally impossible between species
- E) associated with small populations, sometimes referred to as "founder's effect"

Answer: C

14) The initial stimulus for allopatric speciation is thought to be the

- A) geographic isolation of one or more populations from the main portion of the species
- B) intensified gene flow between the populations of a species
- C) spatial clustering of all members of a species
- D) resumption of gene flow after a period of population separation
- E) none of these

Answer: A

- 15) For modern biologists, the defining feature of a species is usually
- A) geographic isolation from other species
 - B) the phenotypic similarity of its members
 - C) phenotypic differences from other species
 - D) reproductive isolation from other species
 - E) greater than 50% genetic incompatibility

Answer: D

- 16) Stabilizing natural selection
- A) preserves current gene frequencies and phenotypic norms
 - B) operates during periods of environmental stability
 - C) contributes to periods of evolutionary stasis in species
 - D) is not a permanent condition for species
 - E) all of the above

Answer: E

- 17) Genetic drift
- A) involves the action of strong natural selection
 - B) works best in large populations with lots of genetic variation
 - C) involves chance fluctuations in a population's gene frequencies
 - D) involves change over long periods of time in large populations
 - E) acts much like stabilizing selection on a species population

Answer: C

- 18) Harmful, unexpressed alleles within a species' gene pool
- A) increase the amount of incest that occurs
 - B) make up the genetic load
 - C) are eliminated by natural selection
 - D) quickly lead to geographic isolation for at least one population
 - E) make extinction more likely

Answer: B

- 19) H. J. Muller won the Nobel Prize in 1946 for his research
- A) on chemical mutations in gold fish
 - B) X-ray -induced mutations in fruit flies
 - C) mapping the genes of the fruit flies
 - D) on human blood groups
 - E) mapping the double-helix structure of DNA

Answer: B

- 20) Sexual selection may involve
- A) competition among members of one sex for access to mates
 - B) differential choice by members of one sex for mates
 - C) the behaviors of various primate species
 - D) sexual dimorphism
 - E) all of the above

Answer: E

- 21) Phyletic transformation
- A) is one of the major forms of speciation in nature
 - B) results in a strong increase in the number of contemporaneous species
 - C) is a form of pseudoextinction
 - D) is one circumstance under which extinction occurs
 - E) is the result of gene flow

Answer: C

- 22) Extinction has the effect(s) of
- A) reducing both species diversity and the number of available ecological niches
 - B) eliminating only species with "bad genes"
 - C) increasing both species diversity and the number of "good genes" shared by all organisms
 - D) reducing species diversity and opening up ecological niches
 - E) creating progress in evolutionary patterns

Answer: D

- 23) Speciation among populations with the same or overlapping geographic ranges is called
- A) sympatric speciation
 - B) parapatric speciation
 - C) allopatric speciation
 - D) chronospeciation
 - E) none of these

Answer: A

- 24) A group of organic compounds that act as the building blocks for proteins is called
- A) nucleotides
 - B) amino acids
 - C) codons
 - D) exons
 - E) RNA

Answer: B

- 25) A trait in its heterozygote condition affords protection against a disease such as a malaria is called a
- A) balanced polymorphism
 - B) genetic load
 - C) point mutation
 - D) hybridization
 - E) immunity

Answer: A

True/False Questions

- 26) Showing change in the composition of a population's gene pool demonstrates that evolution has occurred.

Answer: TRUE

- 27) According to the modern synthesis, populations evolve not individuals.

Answer: TRUE

- 28) Meiosis reduces the chromosome count in somatic cells to the haploid number.

Answer: FALSE

- 29) All of the genes within a cell are located on chromosomes in the nucleus.

Answer: FALSE

- 30) The genetic code consists of nucleotide triplets called a codon that codes for the production of amino acids.

Answer: TRUE

- 31) There are genes for which the environment has no effect on the expression of the gene.

Answer: TRUE

- 32) Allopatric speciation usually starts with the intensification of gene flow between an isolated population and the parent species.

Answer: FALSE

- 33) Directional natural selection occurs in response to environmental change and results in modifications of the population's collective phenotype.

Answer: TRUE

- 34) Evolution can proceed even if there is no genetic variability.

Answer: FALSE

- 35) A deme is another term for a species.

Answer: FALSE

- 36) When used in genetics the term population refers to organisms that share at least some genes
Answer: FALSE
- 37) The gene and environment relationship is expressed as: genotype + environment = phenotype
Answer: TRUE
- 38) Mitochondria contain no genetic material
Answer: FALSE
- 39) About half of the DNA sequence codes for proteins while the other half codes for other compounds
Answer: FALSE
- 40) Genetic flow is the most powerful genetic force for speciation
Answer: FALSE

Short Answer Questions

- 41) When like mate with mate it is called _____.
Answer: assortative mating
- 42) The _____ is a balanced polymorphism which gives some protection against malaria in heterozygous individuals.
Answer: sickle-cell trait
- 43) _____ can be used to test if there are evolutionary changes taking place in a population.
Answer: Hardy-Weinberg theorem
- 44) Competition among members of one sex for access to members of the opposite sex is called _____.
Answer: sexual selection
- 45) _____ is the alteration of a whole species into a new species.
Answer: Phyletic transformation
- 46) _____ is speciation that begins with geographic isolation of at least one population from the larger parent species.
Answer: Allopatric speciation
- 47) _____ are "species" that are made when an evolutionary continuum is arbitrarily divided to time-defined units.
Answer: Chronospecies
- 48) A(n) _____ has a haploid number of chromosomes.
Answer: gamete

49) _____ is often described as the father of genetics.

Answer: Gregor Mendel

50) A(n) _____ is a genetically identical organism reproduced from a single ancestral organism.

Answer: clone

Essay Questions

- 51) Compare and contrast genotype and phenotype. What is the relationship between the genotype and phenotype?
- 52) Describe the process of gamete formation including the stages of meiosis.
- 53) How does sexual selection differ from natural selection?
- 54) Describe the process of allopatric speciation. Explain the contributions of natural selection, isolation, gene flow, genetic drift, and adaptation to the production of new species.
- 55) In a population of 1000 people, 640 lack hair on the pinna of the ear and 360 people have hair growing on the pinna which is the recessive trait. Assuming Hardy-Weinberg equilibrium, what are the allele frequencies for the dominant and recessive traits?