

**MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.**

- 1) In the 1600s, William Harvey studied reproduction and development. What is the term given to the theory which states that an organism develops from the fertilized egg by a succession of developmental events that lead to an adult? 1) \_\_\_\_\_
- A) transduction
  - B) epigenesis
  - C) equational transformation
  - D) sequential pattern formation
  - E) preformation
- 2) What is the term given to the theory which states that the fertilized egg contains a complete miniature adult? 2) \_\_\_\_\_
- A) transformation
  - B) conjugation
  - C) transduction
  - D) preformation
  - E) cell theory
- 3) What is the term given to the theory that put forth the idea that living organisms could arise by incubating nonliving components? 3) \_\_\_\_\_
- A) natural selection
  - B) collective combination
  - C) spontaneous generation
  - D) evolution
  - E) preformation
- 4) Who, along with Alfred Wallace, formulated the theory of natural selection? 4) \_\_\_\_\_
- A) William Harvey
  - B) Louis Pasteur
  - C) James Watson
  - D) Charles Darwin
  - E) Gregor Mendel
- 5) Who was the Augustinian monk that conducted a decade of experiments on the garden pea, eventually showing that traits are passed from parents to offspring in predictable ways? 5) \_\_\_\_\_
- A) Francis Crick
  - B) Aristotle
  - C) Hippocrates
  - D) Alfred Wallace
  - E) Gregor Mendel

6) In many species, there are two representatives of each chromosome. In such species, the characteristic number of chromosomes is called the \_\_\_\_\_ number. It is usually symbolized as \_\_\_\_\_.

- A) haploid;  $2n$
- B) diploid;  $n$
- C) diploid;  $2n$
- D) haploid;  $n$
- E) None of the answers listed are correct.

7) Genetics is the study of \_\_\_\_\_.

- A) inheritance and variation
- B) transcription and translation
- C) replication and recombination
- D) mutation and recession
- E) diploid and haploid

**SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.**

8) Name one of the botanists who, in 1900, rediscovered the work of Gregor Mendel. 8) \_\_\_\_\_

9) Early in the twentieth century, Walter Sutton and Theodor Boveri noted that the behavior of chromosomes during meiosis is identical to the behavior of genes during gamete formation. They proposed that genes are carried on chromosomes, which led to the basis of the \_\_\_\_\_.

10) What is a mutation? 10) \_\_\_\_\_

11) What is a simple definition of an allele? 11) \_\_\_\_\_

12) Until the mid-1940s, many scientists considered proteins to be the likely candidates for the genetic material. Why? 12) \_\_\_\_\_

13) Name the individual who, while working with the garden pea in the mid-1850s, demonstrated quantitative patterns of heredity and developed a theory involving the behavior of hereditary factors. 13) \_\_\_\_\_

14) What does the term *genetics* mean? 14) \_\_\_\_\_

15) Name two individuals who provided the conceptual basis for our present understanding that genes are on chromosomes. 15) \_\_\_\_\_

16) What term is used to describe the fact that different genes in an organism often provide differences in observable features? 16) \_\_\_\_\_

17) What term refers to the similarity between parents and offspring and what term refers to the lack of similarity between parents and offspring? 17) \_\_\_\_\_

18) Alternative forms of a gene are called \_\_\_\_\_. 18) \_\_\_\_\_

- 19) The various characteristics of organisms that result from their genetic makeup are collectively referred to as an organism's \_\_\_\_\_. 19) \_\_\_\_\_
- 20) Name the substance that serves as the hereditary material in eukaryotes and prokaryotes. 20) \_\_\_\_\_
- 21) In nonviral systems, what is the nature of the hereditary substance? 21) \_\_\_\_\_
- 22) A fundamental property of DNA's nitrogenous bases that is necessary for the double-stranded nature of its structure is \_\_\_\_\_. 22) \_\_\_\_\_
- 23) Distinguish the functions of DNA and RNA in a eukaryote. 23) \_\_\_\_\_
- 24) Name the bases in DNA and their pairing specificities. 24) \_\_\_\_\_
- 25) What is meant by the term *genetic code*? 25) \_\_\_\_\_
- 26) List the two relatively complex processes in which genetic information is converted into functional products. 26) \_\_\_\_\_
- 27) What is the composition of the genetic material? 27) \_\_\_\_\_
- 28) What is meant by *complementarity* in terms of the structure of DNA? 28) \_\_\_\_\_
- 29) Reference is often made to *adapter molecules* when describing protein synthesis in that they allow amino acids to associate with nucleic acids. To what class of molecules does this term refer? 29) \_\_\_\_\_
- 30) Given that DNA is the genetic material in prokaryotes and eukaryotes, what other general structures (macromolecules) and substances made by the cell are associated with the expression of that genetic material? 30) \_\_\_\_\_
- 31) What is another term for a biological catalyst? 31) \_\_\_\_\_
- 32) Research dealing with which human blood disorder was instrumental in linking the genotype to a specific phenotype, and what conclusion was reached? 32) \_\_\_\_\_
- 33) Recombinant DNA technology is dependent on a particular class of enzymes, known as \_\_\_\_\_ that cuts DNA at specific nucleotide sequences. 33) \_\_\_\_\_
- 34) What represents an organism's genome? 34) \_\_\_\_\_
- 35) What is a transgenic organism? 35) \_\_\_\_\_
- 36) In 1996, a cloning experiment produced the sheep named Dolly. Contrary to the more traditional method of cloning by embryo splitting, Dolly was produced by which procedure? 36) \_\_\_\_\_

- 37) What term is applied to a variety of projects whereby genome sequences are deposited in databases for research purposes? 37) \_\_\_\_\_
- 38) The human genome sequence was reported in 2003 by two groups, the publicly funded \_\_\_\_\_ and \_\_\_\_\_. 38) \_\_\_\_\_
- 39) A number of genomes have been sequenced in recent years: *Escherichia coli*, *Saccharomyces cerevisiae*, *Caenorhabditis elegans*, *Drosophila melanogaster*, and *Mus musculus*. What are the common names for these organisms? 39) \_\_\_\_\_
- 40) Organisms that are well understood from a scientific standpoint and are often used in basic biological research are often called \_\_\_\_\_. 40) \_\_\_\_\_
- 41) *Arabidopsis* is a model organism for the study of \_\_\_\_\_. 41) \_\_\_\_\_

**TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false.**

- 42) Genetics is the study of heredity and variation. 42) \_\_\_\_\_
- 43) Complementarity in a genetic sense refers to the polymerization of nucleotides in DNA. 43) \_\_\_\_\_
- 44) Bioinformatics is a discipline involved in the development of both hardware and software for processing, storing, and retrieving nucleotide and protein data. 44) \_\_\_\_\_

## Answer Key

Testname: UNTITLED1

- 1) B
- 2) D
- 3) C
- 4) D
- 5) E
- 6) C
- 7) A
- 8) Carl Correns, Hugo de Vries, Erich Tschermak
- 9) Chromosome Theory of Inheritance
- 10) A mutation is an inherited change in a gene.
- 11) An allele is a variant form of a gene.
- 12) Proteins are the most abundant, universally distributed components in cells. They were considered likely candidates because of their great structural and functional diversity.
- 13) Gregor Mendel
- 14) Genetics is a subdiscipline of biology concerned with the study of heredity and variation at the molecular, cellular, developmental, organismal, and populational levels.
- 15) Walter Sutton and Theodor Boveri
- 16) phenotype
- 17) Heredity refers to the similarity between parents and offspring and the similarity of members of the same species. Variation refers to the lack of similarity between parents and offspring and members of the same species.
- 18) alleles
- 19) phenotype
- 20) DNA or deoxyribonucleic acid
- 21) DNA (deoxyribonucleic acid) is a double-stranded polymer organized as a double helix.
- 22) complementarity
- 23) DNA is responsible for the storage and replication of genetic information; RNA is involved in the expression of stored genetic information.
- 24) adenine:thymine, guanine:cytosine
- 25) The genetic code consists of a linear series of three adjacent nucleotides present in mRNA molecules.
- 26) transcription and translation
- 27) polymers of nucleotides making up DNA
- 28) base pairing of A with T, and G with C
- 29) tRNA
- 30) RNA (messenger, ribosomal, transfer), ribosomes, enzymes, proteins
- 31) enzyme
- 32) The work on sickle-cell anemia was instrumental in showing that a mutant gene produced a mutant protein molecule.
- 33) restriction enzymes
- 34) An organism's genome can be defined as the complete haploid DNA content of an organism.
- 35) A transgenic organism is an organism produced by biotechnology that involves the transfer of hereditary traits across species.
- 36) transfer of genetic material from an adult mammary cell
- 37) genomics
- 38) Human Genome Project; a private, industry-funded project
- 39) bacterium, yeast, roundworm, fruit fly, mouse
- 40) model organisms
- 41) plants
- 42) TRUE
- 43) FALSE
- 44) TRUE