Student name:\_\_\_\_\_\_\_\_\_\_

**MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.  
1)** The basic unit of heredity is the \_\_\_\_\_\_\_\_\_\_\_.

A) individual   
 B) gene  
 C) macromolecule  
 D) trait

**2)** A variation of a gene is called a(n) \_\_\_\_\_\_\_.

A) species   
 B) morph  
 C) genome  
 D) allele  
 E) proteome

**3)** Which of the following acts to accelerate chemical reactions in a cell?

A) nucleic acids   
 B) lipids  
 C) carbohydrates  
 D) enzymes

**4)** The building blocks of DNA are \_\_\_\_\_\_\_\_\_\_\_\_\_.

A) amino acids   
 B) carbohydrates  
 C) enzymes  
 D) nucleotides  
 E) lipids

**5)** A cellular structure that contains genetic information is called a \_\_\_\_\_\_\_\_\_\_\_.

A) nucleotide   
 B) genetic code  
 C) chromosome  
 D) nucleic acid

**6)** If a carbohydrate is going to be broken down for energy, which of the following molecules would be directly involved in the breakdown?

A) enzymes   
 B) nucleotides  
 C) microtubules  
 D) lipids  
 E) chromosomes

**7)** RNA is formed by the process of \_\_\_\_\_\_\_\_\_\_\_\_\_.

A) transcription   
 B) translation  
 C) both transcription and translation

**8)** A characteristic that an organism displays is called \_\_\_\_\_\_\_\_\_\_.

A) a gene   
 B) a chromosome  
 C) DNA  
 D) gene expression  
 E) a trait

**9)** If a geneticist is studying the prevalence of a trait in a species, they are at the \_\_\_\_\_\_\_\_\_ level of study.

A) population   
 B) organismal  
 C) cellular  
 D) molecular

**10)** The study of the processes of transcription and translation is at the \_\_\_\_\_ level of biological organization.

A) population   
 B) organismal  
 C) cellular  
 D) molecular

**11)** Genetic variation is ultimately based upon which of the following?

A) morphological differences   
 B) variations in nucleotide sequence of the DNA  
 C) carbohydrate content of the cell  
 D) translation

**12)** A species that contains two copies of each chromosome is called \_\_\_\_\_\_\_.

A) a genetic mutation   
 B) a morph  
 C) haploid  
 D) diploid  
 E) alleles

**13)** A diploid cell within an organism's body that is not a reproductive cell is \_\_\_\_\_\_\_.

A) a gamete   
 B) a somatic cell  
 C) an allele  
 D) rare  
 E) a sperm cell

**14)** In many organisms, one set of chromosomes comes from the maternal parent, while the other set comes from the paternal parent. Similar chromosomes in these sets are said to be \_\_\_\_\_\_\_\_\_.

A) morphs   
 B) alleles  
 C) haploid  
 D) homologs  
 E) physiological traits

**15)** In humans, gametes are different than other cells of the body in that they are \_\_\_\_\_\_\_\_\_.

A) diploid   
 B) haploid  
 C) genetic mutations  
 D) morphs

**16)** What is natural selection?

A) When nongenetically based traits are passed from one generation to the next   
 B) A process that allows traits to remain the same over many generations  
 C) A process in which environmental constraints enable some phenotypes to be more successful than others  
 D) When one phenotype is as successful as all other phenotypes

**17)** \_\_\_\_\_\_\_ is the use of the information in gene sequences to synthesize functional proteins that affect cellular characteristics.

A) Loss-of-function mutation   
 B) Gene expression  
 C) The human genome project  
 D) Proteomics

**18)** The differences in inherited traits among individuals in a population are called \_\_\_\_\_\_\_.

A) species variation   
 B) genetic mutations  
 C) genetic variation  
 D) natural selection

**19)** Three populations of an organism, each with drastically different external markings, but still members of the same species, would be called \_\_\_\_\_\_\_.

A) homologs   
 B) mutants  
 C) communities  
 D) alleles  
 E) morphs

**20)** Which one of the following is NOT one of the general classes of macromolecules that are necessary for cellular function?

A) nucleic acids   
 B) proteins  
 C) ions  
 D) carbohydrates  
 E) lipids

**21)** The changes in the genetic makeup of a population over time is called \_\_\_\_\_\_\_.

A) homologous recombination   
 B) model organisms studies  
 C) genetic crosses  
 D) biological evolution  
 E) hypothesis testing

**22)** Which of the following could be used to study the effects of drugs on gene expression?

A) population genetics   
 B) transmission genetics  
 C) molecular genetics  
 D) quantitative genetics

**23)** Which of the following uses a genetic cross to determine patterns of inheritance?

A) population genetics   
 B) transmission genetics  
 C) molecular genetics  
 D) evolutionary genetics

**24)** The traits of an individual organism can be influenced by both genes and the \_\_\_\_\_\_.

A) genome   
 B) environment  
 C) population size  
 D) genetic variation within a population

**25)** Most cellular characteristics, such as structure and function, are the result of the synthesis and activity of different \_\_\_\_\_\_.

A) DNA   
 B) carbohydrates  
 C) lipids  
 D) proteins

**26)** Genetics is an experimental, as opposed to theoretical, science because \_\_\_\_\_\_.

A) hypotheses are tested by performing experiments   
 B) hypotheses are tested by reviewing the literature to see what others have found  
 C) no hypotheses are accepted or rejected unless they are voted on by a council of scientists  
 D) it does not rely on observations but only hypothesis testing experiments

**27)** Performing a mating of two plants, one with a known genotype and the other with an unknown genotype, to determine the genotype of the individual with the unknown genotype would be an example what type of science?

A) discovery-based science   
 B) hypothesis testing  
 C) unethical experimentation  
 D) an impossible experiment

**28)** What is the first step that both scientists and students perform to answer questions in genetics?

A) Gathering background information   
 B) Reaching a conclusion  
 C) Analyzing data  
 D) Performing an experiment

**29)** Mice have 20 chromosomes in their sperm cells. How many chromosomes does a somatic cell from a mouse contain?

A) 20   
 B) 40  
 C) 10  
 D) 80

**30)** Chronic myelogenous leukemia cells are characterized by the so-called Philadelphia chromosome, which contains part of chromosome 22 fused with chromosome 9. The Philadelphia chromosome is the result of a translocation, in which two chromosomes exchange material. The genetic variation found in chronic myelogenous leukemia is therefore due to

A) gene mutations.   
 B) major alterations in the structure of a chromosome.  
 C) variation in the total number of chromosomes.

**31)** You work in a lab. You engineer a mutant mouse that doesn't synthesize a protein important for breakdown of the sugar galactose and study the results. What type of geneticist are you?

A) Transmission geneticist   
 B) Molecular geneticist  
 C) Population geneticist  
 D) Proteome geneticist

**32)** Ball pythons of the same species can look very different from one another. In fact, there are at least 26 types of ball pythons, characterized by their color, eyes, and markings. The blue-eyed leucistic ball python has blue eyes and white scales. The bumblebee ball python has black and yellow scales. The coral glow ball python has purple and orange scales. What term best describes these different types of pythons?

A) Morphs   
 B) Alleles  
 C) Homologs  
 D) Model organisms

**33)** You are a geneticist trying to understand why Tay-Sachs disease is more prevalent in Ashkenazi Jews compared to other groups of people. What level of biological organization are you studying?

A) Molecular level   
 B) Cellular level  
 C) Organism level  
 D) Population level

**Answer Key**Test name: chapter 1

1) B

2) D

3) D

4) D

5) C

6) A

7) A

8) E

9) A

10) D

11) B

12) D

13) B

14) D

15) B

16) C

17) B

18) C

19) E

20) C

21) D

22) C

23) B

24) B

25) D

26) A

27) B

28) A

29) B

Sperm cells are haploid gamete cells. That means they contain half the number of chromosomes of the somatic cells, which are the cells that make up most of the body. Somatic cells are diploid. Therefore, if sperm in mice contain 20 chromosomes, somatic cells in mice will contain 40 chromosomes.

30) B

The genetic variation found in chronic myelogenous leukemia is due to a chromosome that contains portions of two different chromosomes. This is the result of a major alteration in the structure of the chromosome, joining two chromosomal pieces together that are normally not found together.

31) B

The three major fields of genetics are transmission, molecular, and population genetics. Molecular geneticists often analyze the effect of a mutation that eliminates the function of a gene, which allows them to deduce the function of that gene. In this case, by eliminating the function of a gene in a mouse and studying the results, you are conducting a molecular genetics experiment.

32) A

Since these snakes of the same species exhibit very different markings, they are an example of morphs. Morphs are contrasting forms within the same species.

33) D

Understanding how a trait occurs within a species is studying that trait at the population level. Population geneticists study why traits are prevalent within a population.