CHAPTER 13—GENES AND CHROMOSOMES

MULTIPLE CHOICE

1. _____ is usually lethal because a _____ of genetic material is lost.
   a. Triploidy, small amount
   b. Monosomy, small amount
   c. Triploidy, great amount
   d. Monosomy, greater amount

   ANS: D DIF: B OBJ: 13-6

2. Triploidy is usually _____ in animals.
   a. beneficial
   b. planned
   c. rare
   d. normal

   ANS: C DIF: B OBJ: 13-5

3. What is the name of the condition in which the zygote contains only one chromosome of a pair as a result of nondisjunction?
   a. trisomy
   b. polyploidy
   c. monosomy
   d. monoploidy

   ANS: C DIF: B OBJ: 13-5

4. The condition in which a zygote contains three copies of a particular chromosome as a result of nondisjunction is called _____.
   a. trisomy
   b. polyploidy
   c. monosomy
   d. monoploidy

   ANS: A DIF: B OBJ: 13-5

5. The chromosome abnormality that occurs when part of one chromosome breaks off and is added to a different chromosome is _____.
   a. deletion
   b. nondisjunction
   c. translocation
   d. inversion

   ANS: C DIF: B OBJ: 13-5

6. _____ is a chromosome rearrangement that results in no loss of genetic information from the chromosome.
   a. Inversion
   b. Translocation
   c. Deletion
   d. Nondisjunction

   ANS: A DIF: B OBJ: 13-5

7. The pairing of _____ in DNA is the key feature that allows DNA to be copied.
   a. nucleotides
   b. nitrogen bases
   c. chromosomes
   d. codons

   ANS: B DIF: B OBJ: 13-2

8. The process by which a DNA molecule is copied is called _____.
   a. binary fission
   b. mitosis
   c. replication
   d. translation

   ANS: C DIF: B OBJ: 13-2

9. A DNA nucleotide may be made up of a phosphate group, along with _____.
   a. deoxyribose sugar and uracil
   b. ribose sugar and adenine
   c. deoxyribose sugar and thymine
   d. ribose sugar and cytosine

   ANS: C DIF: B OBJ: 13-1

10. Which series is arranged in order from largest to smallest in size?
    a. chromosome, nucleus, cell, DNA, nucleotide
    b. cell, nucleus, chromosome, DNA, nucleotide
    c. nucleotide, chromosome, cell, DNA, nucleus
    d. cell, nucleotide, nucleus, DNA, chromosome

    ANS: B DIF: B OBJ: 13-1

11. The hereditary information for a particular trait is generally _____.
    a. controlled by alleles located on chromosomes
    b. controlled by chromosomes located on an allele
    c. carried from the nucleus by tRNA to the gamete
    d. coded for by a ribosome located on the reticulum

    ANS: A DIF: B OBJ: 13-3

12. An RNA molecule is a polymer composed of subunits known as _____.
    a. polysaccharides
    b. ribose molecules
    c. nucleotides
    d. uracil molecules

    ANS: C DIF: B OBJ: 13-1

13. X rays, ultraviolet light, and radioactive substances that can change the chemical nature of DNA are classified as _____.
    a. growth regulators
    b. metamorphic molecules
    c. hydrolytic enzymes
    d. mutagenic agents

    ANS: D DIF: B OBJ: 13-5

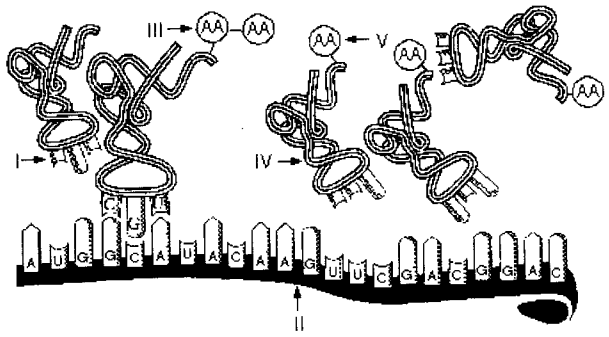

Figure 13-2

14. Where in the cell of Figure 13-2 does translation occur?
    a. in the nucleus
    b. in food vacuoles
    c. at the ribosomes
    d. within the plasma membrane

    ANS: C DIF: B OBJ: 13-4

15. Which of the structures in Figure 13-2 are composed of RNA?
    a. II and IV
    b. III and IV
    c. I and V
    d. III and V

    ANS: A DIF: B OBJ: 13-4

16. Structure III in Figure 13-2 represents a(n) _____.
    a. gene
    b. amino acid
    c. codon
    d. DNA molecule

    ANS: B DIF: B OBJ: 13-4

17. The process illustrated in Figure 13-2 is called _____.
    a. translation
    b. replication
    c. monoploidy
    d. transcription

    ANS: A DIF: B OBJ: 13-4

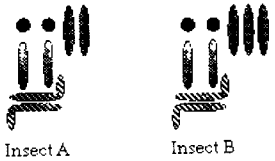

Figure 13-3

18. The diagram labeled Insect A in Figure 13-3 represents the chromosomes taken from the body cell of a normal female insect. The diagram labeled Insect B represents those taken from the body cell of a female of the same species but with an abnormal phenotype. The chromosomal alteration seen in Insect B could have resulted from _____.
    a. nondisjunction
    b. crossing over
    c. a frameshift mutation
    d. a point mutation

    ANS: A DIF: B OBJ: 13-5

Table 13-1

Help Wanted

Positions Available in the genetics industry. Hundreds of entry-level openings for tireless workers. No previous experience necessary. Must be able to transcribe code in a nuclear environment. The ability to work in close association with ribosomes is a must.

Accuracy and Speed vital for this job in the field of translation. Applicants must demonstrate skills in transporting and positioning amino acids. Salary commensurate with experience.

Executive Position available. Must be able to maintain genetic continuity through replication and control cellular activity by regulation of enzyme production. Limited number of openings. All benefits.

Supervisor of production of proteins—all shifts. Must be able to follow exact directions from double-stranded template. Travel from nucleus to the cytoplasm is additional job benefit.

19. Applicants for the fourth job of the Help Wanted ad in Table 13-1, "Supervisor," could qualify if they were _____.
    a. DNA
    b. mRNA
    c. tRNA
    d. rRNA

    ANS: B DIF: A OBJ: 13-4

20. Applicants for the third job of the Help Wanted ad in Table 13-1, "Executive Position," could qualify if they were _____.
    a. DNA
    b. mRNA
    c. tRNA
    d. rRNA

    ANS: A DIF: A OBJ: 13-4

21. Applicants for the second job of the Help Wanted ad in Table 13-1, "Accuracy and Speed," could qualify if they were _____.
    a. DNA
    b. mRNA
    c. tRNA
    d. rRNA

    ANS: C DIF: A OBJ: 13-4

22. Applicants for the first job of the Help Wanted ad in Table 13-1, "Positions Available," could qualify if they were _____.
    a. DNA
    b. mRNA
    c. tRNA
    d. rRNA

    ANS: B DIF: A OBJ: 13-4

COMPLETION

1. A human female with only a single X chromosome is an example of a genetic condition called _____.

   ANS: monosomy DIF: B OBJ: 13-5

2. When parts of chromosomes are broken off and lost during mitosis or meiosis, the result is a(n) _____.

   ANS: chromosomal mutation DIF: B OBJ: 13-5

3. The process of converting RNA code into an amino acid sequence is called _____.

   ANS: translation DIF: B OBJ: 13-4

4. _____ is the failure of a pair of homologous chromosomes to separate properly during meiosis.

   ANS: Nondisjunction DIF: B OBJ: 13-5

5. A change in a single base pair of the DNA molecule that affects the synthesis of an entire protein is called a(n) _____.

   ANS: point mutation DIF: B OBJ: 13-5

6. _____ brings amino acids to the ribosomes for the assembly of proteins.

   ANS: tRNA DIF: B OBJ: 13-4

7. Each set of three nitrogen bases representing an amino acid is referred to as a(n) _____.

   ANS: codon DIF: B OBJ: 13-3

8. The process by which DNA makes a copy of itself is called _____.

   ANS: replication DIF: B OBJ: 13-2

9. Thymine, adenine, guanine, and cytosine are classified as _____.

   ANS: nitrogen bases DIF: B OBJ: 13-1