Bio12-Q2W8-Quarter Exam 1

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. What must be on either end of any genetic material that is inserted into the cleaved DNA in Figure 13-5?

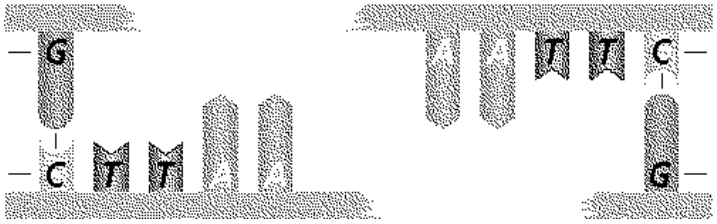


Figure 13-5

a. AATT
b. CCGG
c. CGCG
d. ATAT

____ 2. A child is diagnosed with a rare genetic disease. Neither parent has the disease. How might the child have inherited the disorder?
a. The disorder is recessive and carried by both parents.
b. The disorder could occur only as a mutation in the child because neither parent had the disease.
c. The disorder is sex linked and inherited only from the father.
d. The disorder is dominant and was carried by a parent.

____ 3. The chromosome abnormality that occurs when part of one chromosome breaks off and is added to a different chromosome is _____.
a. deletion
b. translocation
c. inversion
d. nondisjunction

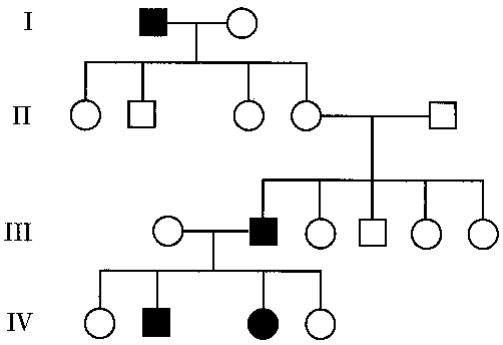


Figure 12-3

____ 4. Based on Figure 12-3, what do you know about individual III-1's mother?
a. She was homozygous recessive.
b. She was homozygous dominant.
c. She was a carrier.
d. She had the trait.

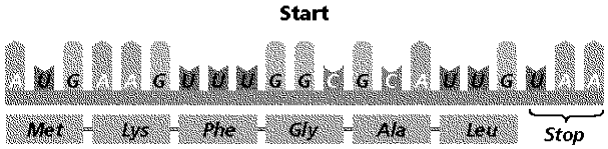
____ 5. According to the pedigree in Figure 12-3, how many of the offspring in the III generation show the normal trait?
a. 1
b. 2
c. 5
d. 4

____ 6. Genes located on homologous chromosomes may have alternate forms that control different forms of a trait. These alternate forms of a gene are called _____.
a. gametes
b. phenotypes
c. alleles
d. centromeres

____ 7. A DNA segment is changed from -AATTAGAAATAG- to -ATTAGAAATAG-. This is a ____.
a. inversion
b. frameshift mutation
c. translation
d. point mutation

____ 8. The effort to completely map and sequence the human genome will likely result in knowing the sequence of the approximately _____ genes on the 46 human chromosomes.
a. 3 billion
b. 46
c. 35 000 to 40 000
d. 10 000

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



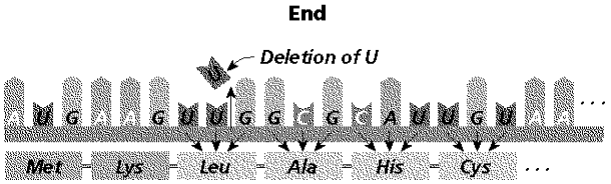


Figure 11-4

____ 10. What will be the result of the mutation in Figure 11-4?
a. it will have no affect on protein function
b. nearly every amino acid in the protein will be changed
c. the organism will die
d. only one amino acid will change

____ 11. Which of the following would be an example of gene therapy technology?
a. development of a nasal spray that contains copies of the normal gene that is defective in persons with cystic fibrosis
b. cutting DNA into fragments with restriction enzymes
c. separation DNA fragments using gel electrophoresis
d. modifying E. coli to produce indigo dye for coloring denim blue jeans

____ 12. A white mouse whose parents are both white produces only brown offspring when mated with a brown mouse. The white mouse is most probably _____.
a. homozygous recessive
b. homozygous dominant
c. heterozygous
d. haploid

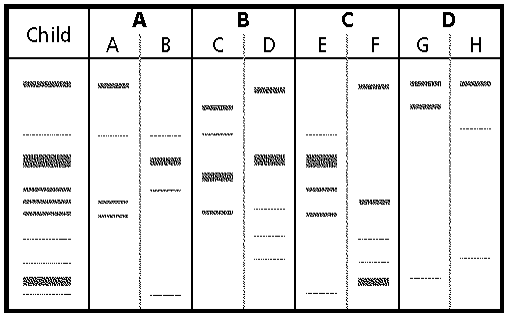


Figure 13-8

____ 13. According to Figure 13-8, which are the parents of the child?
a. A
b. D
c. B
d. C

____ 14. According to Figure 13-8, which parents might give a false positive if only the longer DNA fragments were analyzed?
a. D
b. B
c. A
d. C

____ 15. Which of the following genetic disorders can be detected by karyotyping?
a. Klinefelter syndrome and sickle-cell anemia
b. hemophilia and cystic fibrosis
c. Down syndrome
d. Tay-Sachs disease and phenylketonuria

____ 16. The process used to separate DNA segments of different lengths is _____.
a. gel electrophoresis
b. PCR
c. gene amplification
d. all of these

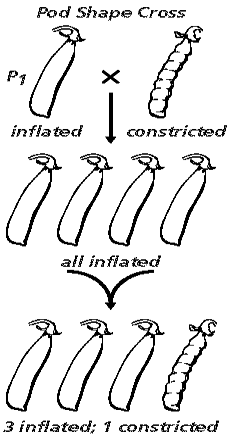


Figure 10-5

____ 17. What is the phenotype of generation 1 in Figure 10-5?
a. II
b. constricted
c. inflated
d. Ii

____ 18. What is the genotype of generation 1 in Figure 10-5?
a. II
b. I
c. ii
d. Ii

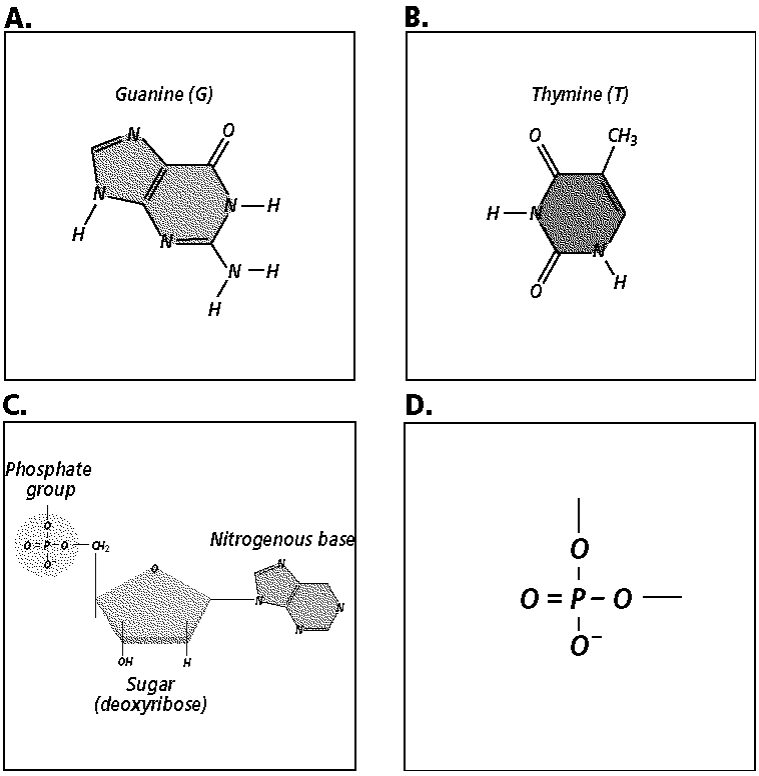


Figure 11-3

____ 19. Which structure shown in Figure 11-3 does not contain a nitrogenous base?
a. A
b. D
c. B
d. C

____ 20. Which structure shown in Figure 11-3 is a pyrimidine?
a. D
b. A
c. C
d. B

____ 21. Which structure shown in Figure 11-3 would attract a free cytosine nucleotide?
a. B
b. A
c. D
d. C

____ 22. Messenger RNA is formed in the process of _____.
a. transcription
b. translation
c. replication
d. mutation

____ 23. Which one of the following nucleotide pair bonds would be found in a DNA molecule?
a. cytosine-uracil
b. adenine-cytosine
c. guanine-cytosine
d. adenine-guanine

____ 24. Both hemophilia and red-green color blindness are _____.
a. inherited only from the mother
b. located on the Y chromosome
c. caused by a dominant gene
d. sex-linked conditions

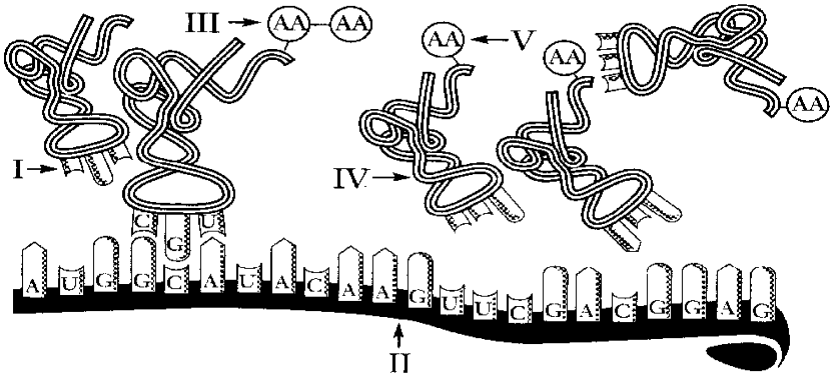


Figure 11-1

____ 25. The process illustrated in Figure 11-1 is called _____.

a. translation
b. transcription
c. monoploidy
d. replication

____ 26. Which of the structures in Figure 11-1 are composed of RNA?

a. I and V
b. III and IV
c. III and V
d. II and IV

____ 27. In which part of the cell does this process shown in Figure 11-1 take place?

a. on the chromosome
b. in the nucleus
c. at the ribosomes
d. in food vacuoles

____ 28. What is the genotype in the bottom left-hand quadrant in Figure 10-6?

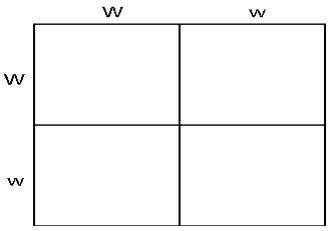


Figure 10-6

a. wW
b. WW
c. Ww
d. ww

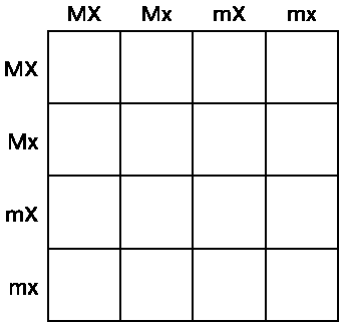


Figure 10-7

____ 29. How should the top row of Figure 10-7 read?

a. MMxX, MMxx, MmxX, Mmxx
b. MMXX, MMXx, MmXX, MmXx
c. mMxX, mMxx, mmxX, mmxx
d. mMXX, mMXx, mmXX, mmXx

____ 30. A useful device for predicting the possible offspring of crosses between different genotypes is the _____.

a. law of dominance
b. law of independent assortment
c. testcross
d. Punnett square

____ 31. Ribosomes are made of _____.
a. rRNA and protein
b. rRNA and mRNA
c. tRNA and mRNA
d. protein and tRNA

____ 32. Because the gene for red-green color blindness is located on the X chromosome, it is normally <u>not</u> possible for a _____.
a. color blind father to pass the gene on to his daughter
b. carrier mother to pass the gene on to her son
c. carrier mother to pass the gene on to her daughter
d. color blind father to pass the gene on to his son

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.

Table 11-1

____ 33. Applicants for the fourth job of the Help Wanted ad in Table 11-1, "Supervisor," could qualify if they were _____.
a. mRNA
b. tRNA
c. rRNA
d. DNA

____ 34. Applicants for the second job of the Help Wanted ad in Table 11-1, "Accuracy and Speed," could qualify if they were _____.
a. rRNA
b. DNA
c. tRNA
d. mRNA

____ 35. According to Figure 13-7, which DNA sequence will be cleaved by EcoRI, which cuts AATT/TTAA?

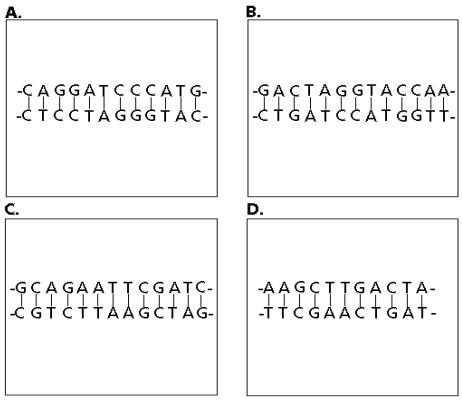


Figure 13-7

a. B
b. A
c. C
d. D

____ 36. A human genetic disorder caused by a dominant gene is _____.
a. Tay-Sachs disease
b. phenylketonuria
c. Huntington's disease
d. cystic fibrosis

____ 37. The passing on of traits from parents to offspring is called _____.
a. gene splicing
b. heredity
c. inbreeding
d. genetics

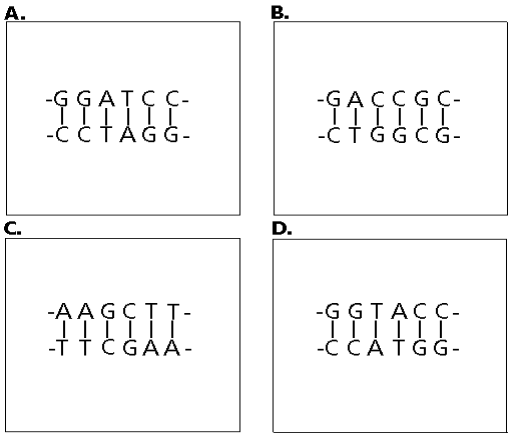


Figure 13-6

____ 38. Which segment in Figure 13-6 is not a palidrome?
a. A
b. C
c. D
d. B

____ 39. If the segments in Figure 13-6 are mixed with several restriction enzymes, which will not be cleaved?
a. A
b. D
c. B
d. C

____ 40. Which segment in Figure 13-6 will attach to genetic material with the sequence TCGA?
a. C
b. A
c. B
d. D

____ 41. The gamete that contains genes contributed only by the mother is _____.
a. an egg
b. the sperm
c. dominant
d. a zygote

____ 42. The reason a fetus afflicted with phenylketonuria is <u>not</u> affected until after birth is that _____.
a. the missing chromosome is compensated for by the mother prior to delivery
b. the child is not bruised or cut during development and therefore does not require a blood-clotting factor
c. because the fetus does not breathe, the accumulation of mucus in the lungs is not dangerous
d. prior to birth, the mother's enzyme level prevents accumulation of the dangerous chemical

____ 43. Eye color in humans is the result of _____ inheritance.
a. multiple allelic
b. sex-linked
c. simple dominant
d. polygenic

____ 44. A cross between a white rooster and a black hen results in 100% blue Andalusian offspring. When two of these blue offspring are mated, the probable phenotypic ratio seen in their offspring would be _____.
a. 25% black, 50% blue, 25% white
b. 75% blue, 25% white
c. 75% black, 25% white
d. 100% blue

____ 45. In mink, brown fur color is dominant to silver-blue fur color. If a homozygous brown mink is mated with a silver-blue mink and 8 offspring are produced, how many would be expected to be silver-blue?
a. 6
b. 3
c. 8
d. 0

____ 46. Cystic fibrosis and Tay-Sachs disease are typical of recessive disorders concentrated in _____.
a. countries with hot, wet climates
b. ethnic groups
c. families with a single child
d. the United States

____ 47. Which of the following describes an organism that has the genotype Bb?
a. heterozygous
b. homozygous
c. inbreed
d. all of these

____ 48. The pairing of _____ in DNA is the key feature that allows DNA to be copied.
a. nitrogen bases
b. codons
c. chromosomes
d. nucleotides

____ 49. Pollination can best be described as _____.
a. the fusing of the egg nucleus with the pollen nucleus
b. the type of cell division that produces diploid gametes
c. the formation of male and female sex cells
d. the transfer of the male pollen grain to the female organ

____ 50. A phenotype that results from a dominant allele must have at least _____ dominant allele(s) present in the parent(s).
a. three
b. four
c. two
d. one

____ 51. Sickle-cell anemia is a genetic disease common to human populations from Africa and the Mediterranean coast. The incidence is greater in these regions than elsewhere because the heterozygous state provides protection against malaria. Individuals afflicted with sickle-cell anemia _____.
a. lack an enzyme that breaks down a lipid produced in the central nervous system
b. will not exhibit the symptoms of the disease until around age 40
c. are two times more likely to be males than to be females
d. suffer tissue damage resulting from oxygen deprivation

____ 52. Mendel's law of segregation states that during meiosis, the factors that control each trait separate, and only _____ from each pair is/are passed to the offspring.
a. two factors
b. one factor
c. the dominant trait
d. the recessive trait

____ 53. A trait controlled by four alleles is said to have _____.
a. hybridization
b. autosomes
c. homologous alleles
d. multiple alleles

____ 54. Which of the following situations is most usual for a dominant allele that results in severe effects in the offspring?
a. Both parents have the trait.
b. Only a single offspring has the trait.
c. The trait occurs by mutation.
d. none of these

____ 55. Watson and Crick were the first to suggest that DNA is _____.
a. a protein molecule
b. a short molecule
c. the genetic material
d. the shape of a double helix

____ 56. In humans, red-green color blindness is _____.
a. caused by a recessive allele
b. equally common in both sexes
c. produced in males by a heterozygous genotype
d. inherited in males from their fathers

____ 57. Most human genetic disorders are caused by the expression of _____.
a. recessive alleles
b. two dominant alleles
c. sex-linked heredity
d. one dominant allele

____ 58. Individuals with Huntington's disease _____.
a. undergo progressive deterioration of the nervous system
b. find breathing difficult and suffer frequent lung infections
c. must have frequent transfusions because their blood lacks a clotting factor
d. suffer from a form of aneuploidy

____ 59. A phenotypic trait that results from a single dominant allele is _____.
a. polydactyly
b. cystic fibrosis
c. more frequent in its appearance
d. attached earlobes

____ 60. 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. cell, nucleotide, nucleus, DNA, chromosome
d. nucleotide, chromosome, cell, DNA, nucleus

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