Bio12-Q2W8-Quarter Exam 3

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

____ 1. Watson and Crick were the first to suggest that DNA is _____.
a. the genetic material
b. the shape of a double helix
c. a protein molecule
d. a short molecule

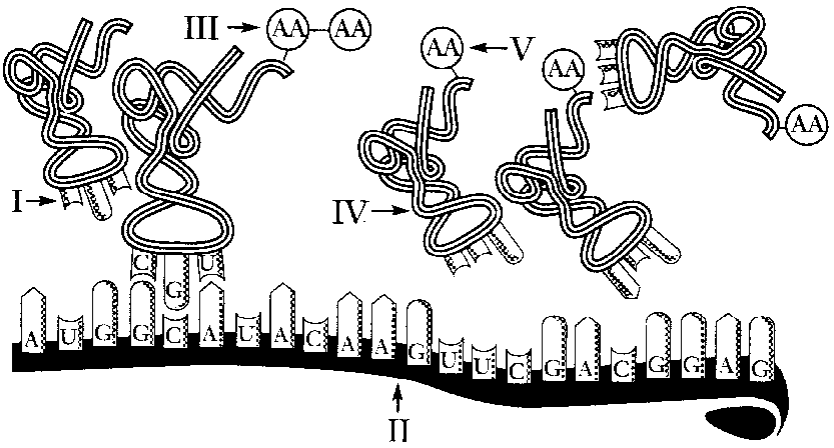


Figure 11-1

____ 2. The process illustrated in Figure 11-1 is called _____.
a. translation
b. replication
c. transcription
d. monoploidy

____ 3. 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. in food vacuoles
d. at the ribosomes

____ 4. Which of the structures in Figure 11-1 are composed of RNA?
a. II and IV
b. III and IV
c. I and V
d. III and V

____ 5. Eye color in humans is the result of _____ inheritance.
a. multiple allelic
b. simple dominant
c. polygenic
d. sex-linked

____ 6. The pairing of _____ in DNA is the key feature that allows DNA to be copied.
a. codons
b. chromosomes
c. nitrogen bases
d. nucleotides

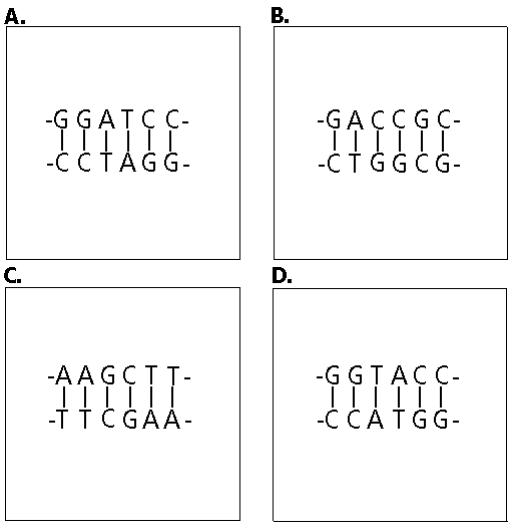


Figure 13-6

____ 7. Which segment in Figure 13-6 will attach to genetic material with the sequence TCGA?
a. B
b. A
c. D
d. C

____ 8. If the segments in Figure 13-6 are mixed with several restriction enzymes, which will not be cleaved?
a. D
b. B
c. C
d. A

____ 9. Which segment in Figure 13-6 is not a palidrome?
a. A
b. D
c. B
d. C

____ 10. The reason a fetus afflicted with phenylketonuria is <u>not</u> affected until after birth is that _____.
a. prior to birth, the mother's enzyme level prevents accumulation of the dangerous chemical
b. because the fetus does not breathe, the accumulation of mucus in the lungs is not dangerous
c. the child is not bruised or cut during development and therefore does not require a blood-clotting factor
d. the missing chromosome is compensated for by the mother prior to delivery

____ 11. The gamete that contains genes contributed only by the mother is _____.

a. a zygote
b. the sperm
c. dominant
d. an egg

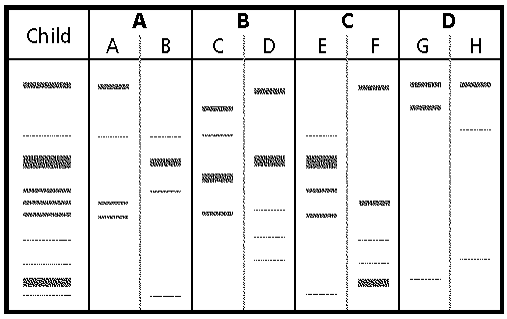


Figure 13-8

____ 12. According to Figure 13-8, which parents might give a false positive if only the longer DNA fragments were analyzed?

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

____ 13. According to Figure 13-8, which are the parents of the child?

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

____ 14. A human genetic disorder caused by a dominant gene is _____.

a. cystic fibrosis
b. phenylketonuria
c. Huntington's disease
d. Tay-Sachs disease

____ 15. What must be on either end of any genetic material that is inserted into the cleaved DNA in Figure 13-5?

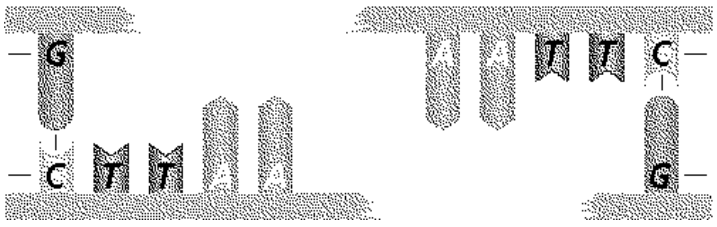


Figure 13-5

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

____ 16. A phenotype that results from a dominant allele must have at least _____ dominant allele(s) present in the parent(s).

a. one
b. four
c. three
d. two

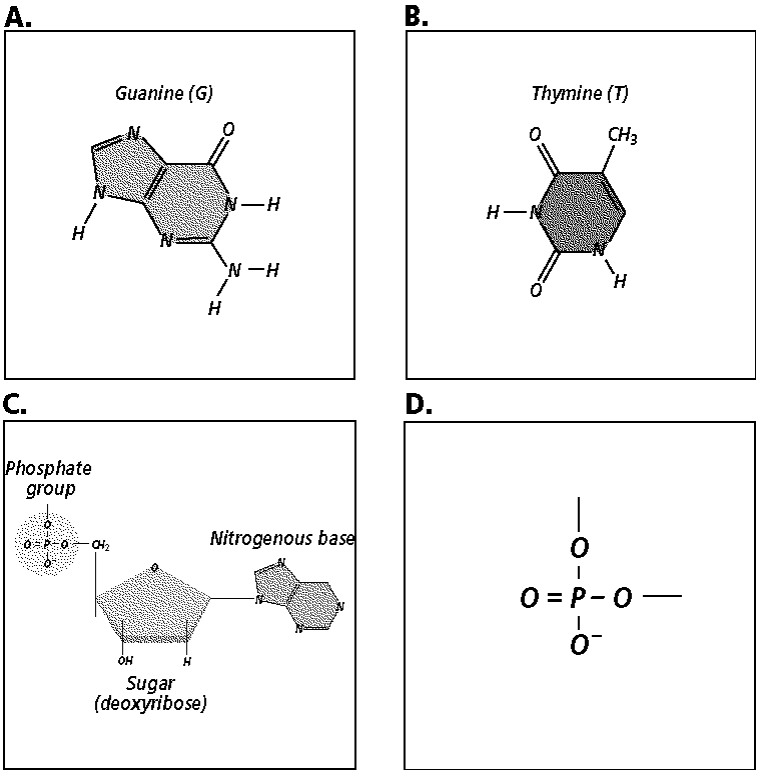


Figure 11-3

____ 17. Which structure shown in Figure 11-3 is a pyrimidine?
a. D
b. C
c. A
d. B

____ 18. Which structure shown in Figure 11-3 would attract a free cytosine nucleotide?
a. A
b. B
c. D
d. C

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

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.

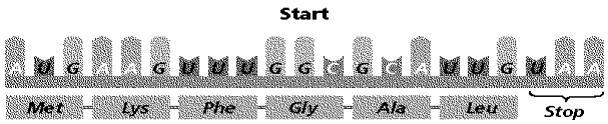
Table 11-1

____ 20. Applicants for the fourth job of the Help Wanted ad in Table 11-1, "Supervisor," could qualify if they were _____.

a. DNA
b. tRNA
c. rRNA
d. mRNA

____ 21. Applicants for the second job of the Help Wanted ad in Table 11-1, "Accuracy and Speed," could qualify if they were _____.

a. DNA
b. tRNA
c. mRNA
d. rRNA



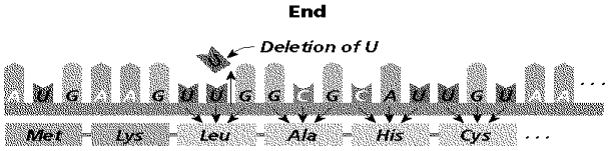


Figure 11-4

____ 22. What will be the result of the mutation in Figure 11-4?

a. it will have no affect on protein function
b. the organism will die
c. nearly every amino acid in the protein will be changed
d. only one amino acid will change

____ 23. In humans, red-green color blindness is _____.

a. caused by a recessive allele
b. inherited in males from their fathers
c. equally common in both sexes
d. produced in males by a heterozygous genotype

____ 24. 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 is sex linked and inherited only from the father.
c. The disorder could occur only as a mutation in the child because neither parent had the disease.
d. The disorder is dominant and was carried by a parent.

____ 25. The process used to separate DNA segments of different lengths is _____.
a. gel electrophoresis
b. gene amplification
c. PCR
d. all of these

____ 26. Which of the following would be an example of gene therapy technology?
a. modifying E. coli to produce indigo dye for coloring denim blue jeans
b. separation DNA fragments using gel electrophoresis
c. development of a nasal spray that contains copies of the normal gene that is defective in persons with cystic fibrosis
d. cutting DNA into fragments with restriction enzymes

____ 27. 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. nondisjunction
d. inversion

____ 28. 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. The trait occurs by mutation.
c. Only a single offspring has the trait.
d. none of these

____ 29. Both hemophilia and red-green color blindness are _____.
a. located on the Y chromosome
b. inherited only from the mother
c. caused by a dominant gene
d. sex-linked conditions

____ 30. A DNA nucleotide may be made up of a phosphate group, along with _____.
a. deoxyribose sugar and uracil
b. deoxyribose sugar and thymine
c. ribose sugar and cytosine
d. ribose sugar and adenine

____ 31. What is the genotype in the bottom left-hand quadrant in Figure 10-6?

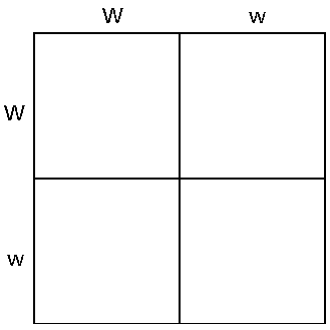


Figure 10-6

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

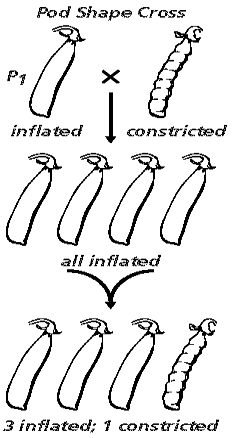


Figure 10-5

____ 32. What is the phenotype of generation 1 in Figure 10-5?
a. II
b. constricted
c. inflated
d. Ii

____ 33. What is the genotype of generation 1 in Figure 10-5?
a. ii
b. Ii
c. I
d. II

____ 34. 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. suffer tissue damage resulting from oxygen deprivation
c. will not exhibit the symptoms of the disease until around age 40
d. are two times more likely to be males than to be females

____ 35. 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. 100% blue
d. 75% black, 25% white

____ 36. The passing on of traits from parents to offspring is called _____.
a. genetics
b. heredity
c. inbreeding
d. gene splicing

____ 37. A DNA segment is changed from -AATTAGAAATAG- to -ATTAGAAATAG-. This is a ____.
a. inversion
b. translation
c. point mutation
d. frameshift mutation

____ 38. Messenger RNA is formed in the process of _____.
a. transcription
b. mutation
c. replication
d. translation

____ 39. Most human genetic disorders are caused by the expression of _____.
a. two dominant alleles
b. one dominant allele
c. recessive alleles
d. sex-linked heredity

____ 40. Cystic fibrosis and Tay-Sachs disease are typical of recessive disorders concentrated in _____.
a. families with a single child
b. ethnic groups
c. the United States
d. countries with hot, wet climates

____ 41. 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. alleles
b. gametes
c. phenotypes
d. centromeres

____ 42. A trait controlled by four alleles is said to have _____.
a. hybridization
b. multiple alleles
c. autosomes
d. homologous alleles

____ 43. 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. 10 000
b. 46
c. 3 billion
d. 35 000 to 40 000

____ 44. A useful device for predicting the possible offspring of crosses between different genotypes is the _____.
a. law of dominance
b. Punnett square
c. law of independent assortment
d. testcross

____ 45. Which of the following describes an organism that has the genotype Bb?
a. inbreed
b. homozygous
c. heterozygous
d. all of these

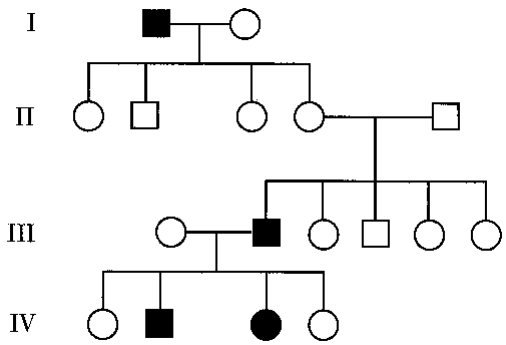


Figure 12-3

____ 46. Based on Figure 12-3, what do you know about individual III-1's mother?
a. She was homozygous dominant.
b. She was homozygous recessive.
c. She was a carrier.
d. She had the trait.

____ 47. According to the pedigree in Figure 12-3, how many of the offspring in the III generation show the normal trait?
a. 5
b. 2
c. 4
d. 1

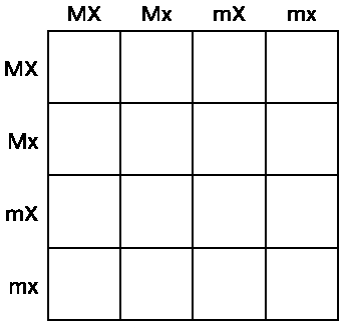


Figure 10-7

____ 48. 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

____ 49. 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. one factor
b. two factors
c. the dominant trait
d. the recessive trait

____ 50. 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. 8
c. 3
d. 0

____ 51. 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 transfer of the male pollen grain to the female organ
d. the formation of male and female sex cells

____ 52. Individuals with Huntington's disease _____.

a. must have frequent transfusions because their blood lacks a clotting factor
b. find breathing difficult and suffer frequent lung infections
c. suffer from a form of aneuploidy
d. undergo progressive deterioration of the nervous system

____ 53. 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 dominant
b. homozygous recessive
c. heterozygous
d. haploid

____ 54. According to Figure 13-7, which DNA sequence will be cleaved by EcoRI, which cuts AATT/TTAA?

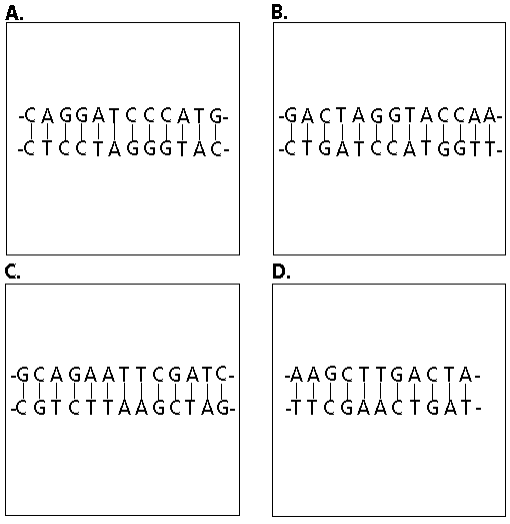


Figure 13-7

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

____ 55. Which of the following genetic disorders can be detected by karyotyping?

a. Klinefelter syndrome and sickle-cell anemia
b. Tay-Sachs disease and phenylketonuria
c. hemophilia and cystic fibrosis
d. Down syndrome

____ 56. Which one of the following nucleotide pair bonds would be found in a DNA molecule?
a. guanine-cytosine
b. adenine-guanine
c. cytosine-uracil
d. adenine-cytosine

____ 57. Ribosomes are made of _____.
a. rRNA and mRNA
b. protein and tRNA
c. tRNA and mRNA
d. rRNA and protein

____ 58. Which series is arranged in order from largest to smallest in size?
a. nucleotide, chromosome, cell, DNA, nucleus
b. cell, nucleus, chromosome, DNA, nucleotide
c. cell, nucleotide, nucleus, DNA, chromosome
d. chromosome, nucleus, cell, DNA, nucleotide

____ 59. 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 daughter
c. color blind father to pass the gene on to his son
d. carrier mother to pass the gene on to her son

____ 60. A phenotypic trait that results from a single dominant allele is _____.
a. polydactyly
b. more frequent in its appearance
c. attached earlobes
d. cystic fibrosis

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