## Bio12-Q2W2-Qs Bank-Human Heredity

**True/False**
*Indicate whether the statement is true or false.*

____ 1. Multiple alleles can be studied only in individuals.
____ 2. Two chromosomes called the sex chromosomes determine the sex of an individual.
____ 3. The first known example of sex-linked inheritance was discovered in pea plants.
____ 4. In humans, there are 23 pairs of matching homologous chromosomes called autosomes.
____ 5. The sex chromosomes of a human male are XX, and the sex chromosomes of a human female are XY.
____ 6. Traits controlled by genes located on sex chromosomes are called sex-linked traits.
____ 7. Traits controlled by more than two alleles are said to have multiple alleles.

**Modified True/False**
*Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.*

____ 8. Polygenic inheritance occurs when there are more than two alleles for a single trait. _____
____ 9. More than two phenotypes result from both multiple allelic inheritance and polygenic inheritance. _____
____ 10. Differing hormone levels among sexes can cause a single genotype to express more than one phenotype. _____

**Matching**

*Match each item with the correct statement below.*

a. cystic fibrosis
b. simple dominant traits
c. Tay-Sachs disease
d. Huntington's disease
e. phenylketonuria

____ 11. Recessive disorder that results from the absence of an enzyme that converts one amino acid into another one
____ 12. Most common genetic disorder among white Americans
____ 13. Widow's peak and hitchhiker's thumb
____ 14. Lethal genetic disorder caused by a dominant allele
____ 15. Recessive disorder that results from the absence of an enzyme required to break lipids down

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

____ 16. 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 could occur only as a mutation in the child because neither parent had the disease.
b. The disorder is dominant and was carried by a parent.
c. The disorder is recessive and carried by both parents.
d. The disorder is sex linked and inherited only from the father.

____ 17. Which of the following diseases is characterized by an accumulation of phenylalanine in the body?
a. PKU
b. Cystic fibrosis
c. Tay-Sachs disease
d. Huntington's disease

____ 18. According to Figure 12-5, what is the chance that individual A will be afflicted with Huntington's?

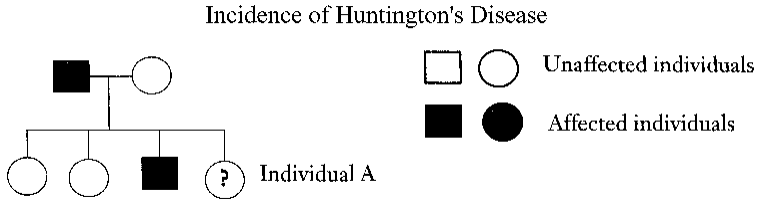



**Figure 12-5**

a. 50%
b. 75%
c. 25%
d. 100%

____ 19. A human genetic defect that results in the failure to metabolize the amino acid phenylalanine is _____.
a. Down syndrome
b. Turner syndrome
c. phenylketonuria
d. cystic fibrosis

____ 20. A man carrying the allele for Huntington's disease marries a woman who is homozygous recessive for the allele. What is the probability that their offspring will develop Huntington's disease?
a. 1/2
b. 3/4
c. 1/4
d. None of the above

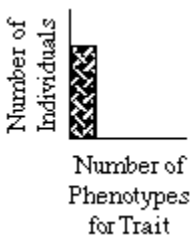
____ 21. When roan cattle are mated, 25% of the offspring are red, 50% are roan, and 25% are white. Upon examination, it can be seen that the coat of a roan cow consists of both red and white hairs. This trait is one controlled by _____.
a. sex-linked genes
b. codominant alleles
c. polygenic inheritance
d. multiple alleles

____ 22. Two healthy parents produce a child with the genetic disorder of cystic fibrosis, which is the result of a recessive gene. What would be the best explanation for this inheritance?
a. Both parents carried the recessive gene for cystic fibrosis.
b. Cystic fibrosis is caused by a mutation in the 21st pair of chromosomes.
c. This is not the result of a genetic disorder.
d. Cystic fibrosis is a chromosomal mutation that occurred during development and is not related to the parental genotypes.

____ 23. In humans, red-green color blindness is _____.
a. equally common in both sexes
b. inherited in males from their fathers
c. caused by a recessive allele
d. produced in males by a heterozygous genotype

____ 24. Cystic fibrosis and Tay-Sachs disease are typical of recessive disorders concentrated in _____.
a. the United States
b. countries with hot, wet climates
c. ethnic groups
d. families with a single child

____ 25. Which of the bar graphs shown below represents what the phenotypic frequencies might be for polygenic inheritance?

a.
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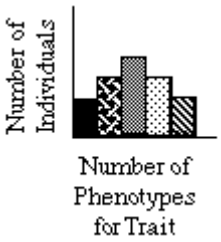


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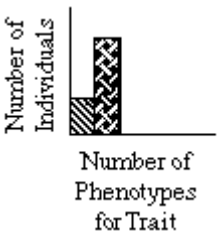
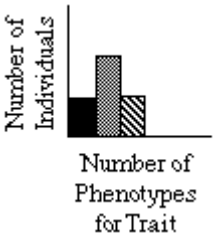



d.


____ 26. The blood types A, B, AB, and O are the result of _____ inheritance.
a. sex-linked
b. simple dominant
c. multiple allelic
d. polygenic

____ 27. An individual has type AB blood. His father has type A blood and his mother has type B blood. The individual's phenotype is an example of —
a. incomplete dominance.
b. simple recessive heredity.
c. simple dominant heredity.
d. codominance.

____ 28. Which of the following disorders is most common among the Amish and Ashkenazic Jewish populations?
a. Cerebral palsy
b. Cystic fibrosis
c. Tay-Sachs disease
d. Phenylketonuria

____ 29. A chart of an individual's chromosome pairs is called a karyotype. Analysis of a karyotype can reveal which of the following?
a. Genotype
b. Phenotype
c. Trisomy
d. All of the above

____ 30. The reason a fetus afflicted with phenylketonuria is <u>not</u> affected until after birth is that _____.
a. the child is not bruised or cut during development and therefore does not require a blood-clotting factor
b. prior to birth, the mother's enzyme level prevents accumulation of the dangerous chemical
c. because the fetus does not breathe, the accumulation of mucus in the lungs is not dangerous
d. the missing chromosome is compensated for by the mother prior to delivery

____ 31. Most human genetic disorders are caused by the expression of _____.
a. two dominant alleles
b. sex-linked heredity
c. recessive alleles
d. one dominant allele

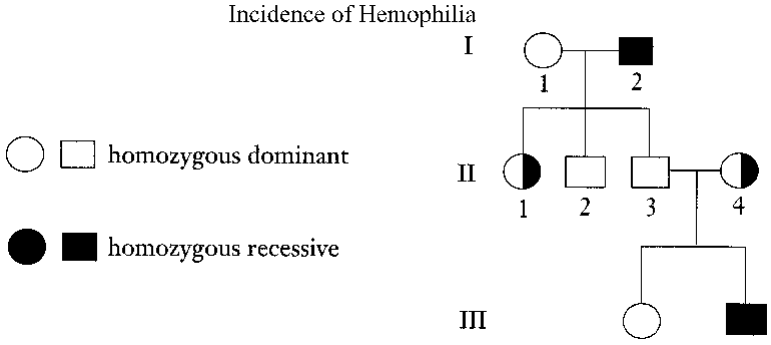



**Figure 12-1**

____ 32. Refer to Figure 12-1. If individual III-2 marries a person with the same genotype as individual I-1, what is the chance that one of their children will be afflicted with hemophilia?
a. 75%
b. 0%
c. 50%
d. 25%

____ 33. For the trait being followed in the pedigree, individuals II-1 and II-4 in Figure 12-1 can be classified as _____.
a. carriers
b. mutants
c. homozygous dominant
d. homozygous recessive

____ 34. 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. Down syndrome
d. hemophilia and cystic fibrosis

____ 35. The type of inheritance shown when a red-flowering plant is crossed with a white-flowering plant and only pink-flowering plants are produced is _____.
a. polygenic inheritance
b. incomplete dominance
c. codominance
d. inbreeding

____ 36. What phenotype is depicted in Figure 12-8?

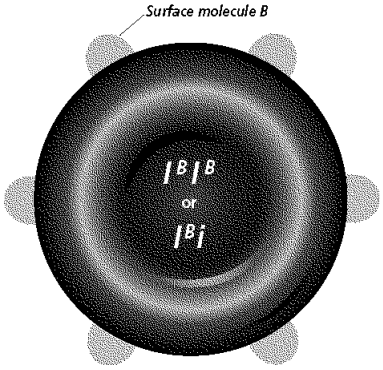



**Figure 12-8**

a. B
b. AB
c. O
d. A

____ 37. Which of the following traits is mediated by X-linked inheritance?
a. Hemophilia
b. Sickle-cell anemia
c. Blood type
d. None of the above

____ 38. 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 son
b. color blind father to pass the gene on to his daughter
c. carrier mother to pass the gene on to her daughter
d. carrier mother to pass the gene on to her son

____ 39. A couple has a child who, with respect to a specific trait, resembles neither parent. Which of the following is NOT a possible mechanism for this trait?
a. Simple recessive heredity
b. Codominance
c. Simple dominant heredity
d. Incomplete dominance

____ 40. A man heterozygous for blood type A marries a woman heterozygous for blood type B. The chance that their first child will have type O blood is _____.
a. 0%
b. 50%
c. 75%
d. 25%

____ 41. You and your colleagues are constructing a pedigree for a patient with cystic fibrosis. The individual's brother has also been diagnosed with cystic fibrosis. How would this brother be represented in the pedigree?
a. Shaded circle
b. Unshaded circle
c. Unshaded square
d. Shaded square

____ 42. Many traits, such as stem length, are controlled by multiple genes. This is called —
a. polygenic inheritance.
b. codominance.
c. simple dominant inheritance.
d. monogenic inheritance.

____ 43. 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. 100% blue
c. 75% black, 25% white
d. 75% blue, 25% white

____ 44. Examine the graph in Figure 12-4, which illustrates the frequency in types of skin pigmentation in humans. Another human trait that would show a similar inheritance pattern and frequency of distribution is _____.

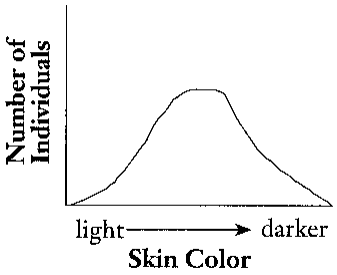



**Figure 12-4**

a. height
b. blood type
c. incidence of cystic fibrosis
d. number of fingers and toes

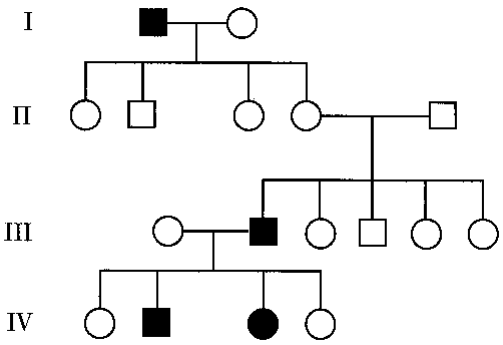



**Figure 12-3**

____ 45. Based on Figure 12-3, what do you know about individual III-1's mother?
a. She was a carrier.
b. She had the trait.
c. She was homozygous dominant.
d. She was homozygous recessive.

____ 46. What is the probable mode of inheritance for the normal trait in Figure 12-3?
a. simple dominant
b. polygenic
c. sex linkage
d. multiple alleles

____ 47. A trait controlled by four alleles is said to have _____.
a. hybridization
b. homologous alleles
c. autosomes
d. multiple alleles

____ 48. 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

____ 49. Eye color in humans is the result of _____ inheritance.
a. simple dominant
b. polygenic
c. sex-linked
d. multiple allelic

____ 50. Following the detection of phenylketonuria or PKU in an infant, the treatment used in order to prevent mental retardation is _____.
a. physical therapy
b. dietary adjustments
c. periodic blood transfusions
d. injection of missing enzymes

____ 51. In Figure 12-7, the trait shown is _____.

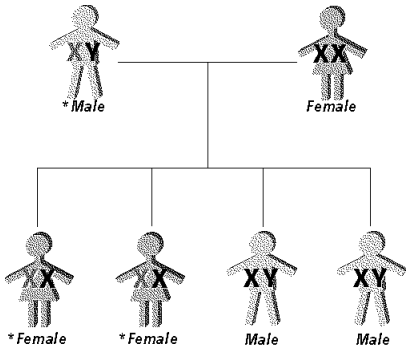



**Figure 12-7**

a. not sex-linked
b. Y-linked
c. X-linked
d. trisomy

____ 52. A human genetic disorder caused by a dominant gene is _____.

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

____ 53. Individuals with Huntington's disease _____.

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

____ 54. If a female fruit fly heterozygous for red eyes ($X^RX^r$) crossed with a white-eyed male ($X^rY$), what percent of their offspring would have white eyes?

a. 0%
b. 25%
c. 50%
d. 75%

____ 55. A phenotype that results from a dominant allele must have at least _____ dominant allele(s) present in the parent(s).

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

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