chapter 20

1. The genetic make-up of an individual is referred to as its:
   A. genotype
   B. phenotype
   C. allele
   D. Punnett square

2. Alternate forms of a gene having the same location (locus) on a pair of chromosomes affecting the same trait are called:
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4. Choose the following letter designation for attached/unattached earlobes that represents heterozygous genotype.
   A. EE
   B. Ee
   C. ee
   D. None of the choices are correct.
5. Choose the following letter designation for attached/unattached earlobes that represents homozygous recessive genotype.

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6. The allele which is traditionally indicated by an uppercase (capital) letter is the:

A. dominant allele
B. recessive allele

7. Alternate forms of a gene that influence the same characteristic and are found at the same location in homologous chromosomes are called:

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10. The letter notations A and a in genetics problems represent:

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11. Which of these indicates a recessive allele?

A. capital letters  
B. lowercase letters  
C. italicized letters  
D. letters in parentheses  
E. numbers

12. Which of these is homozygous?

A. AA  
B. aa  
C. Bb  
D. both AA and aa

13. Which of these is heterozygous?

A. AA  
B. aa  
C. Bb  
D. both AA and aa

14. Which gamete determines the sex of the offspring?

A. male  
B. female  
C. both male and female  
D. it is predetermined
15. Choose the CORRECT statement concerning dominant/recessive traits.

A. The phenotype determines the genotype.
B. The genotype determines the phenotype.
C. Offspring from both homozygous recessive parents are dominant.
D. Offspring from heterozygous parents are all recessive.
E. None of the choices are correct.

16. Choose the ratio for crossing two heterozygous parents for earlobe attachment (Ee x Ee).

A. 1:1
B. 2:1
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D. None of the choices are correct.

17. Choose the ratio for crossing a heterozygous parent for earlobe attachment and a homozygous recessive parent (Ee x ee).

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18. The device used in genetics to calculate the genotype and phenotype of a particular cross is called a:

A. Rubics cube
B. gene matrix
C. dihybrid cross
D. Punnett square
E. None of the choices are correct.

19. In crossing two heterozygous parents, what are the chances for a pure recessive offspring?

A. 75%
B. 50%
C. 25%
D. less than 10%
E. None of the choices are correct.
20. In crossing two heterozygous parents, what are the chances that an offspring will receive a dominant allele?
   A. 75%
   B. 50%
   C. 25%
   D. less than 10%
   E. None of the choices are correct.

21. In crossing a heterozygous parent and a homozygous recessive parent, what are the chances that an offspring will receive a dominant allele?
   A. 75%
   B. 50%
   C. 25%
   D. less than 10%
   E. None of the choices are correct.

22. In humans, red hair is recessive to dark hair. What are the chances of dark-haired parents having a red-haired child if each parent had one red-haired parent?
   A. 0%
   B. 25%
   C. 50%
   D. 75%
   E. 100%

23. If an albino (autosomal recessive trait) woman is married to a man with normal coloring and they have an albino child, what is the genotype of the man?
   A. homozygous dominant
   B. heterozygous
   C. sex-linked
   D. homozygous recessive

24. Word descriptions such as "black" and "short-haired" represent:
   A. phenotype only
   B. genotype only
   C. both phenotype and genotype
   D. neither phenotype nor genotype
25. In humans, brown eyes are dominant over blue eyes. A brown-eyed woman who has a blue-eyed child has the genotype

A. \( bb \)  
B. \( Bb \)  
C. \( BB \)  
D. not able to determine from given information

26. Freckles are dominant over no freckles. If a woman with freckles (homozygous) reproduces with a man with no freckles, what are the chances they will have a child with freckles?

A. 25%  
B. 50%  
C. 100%  
D. 0%

27. A woman who can roll her tongue (dominant) is married to a man who cannot. Two of their four children can roll their tongues, and two cannot. If \( A = \text{roll tongue} \) and \( a = \text{cannot roll tongue} \), then what is the genotype of the parents?

A. woman \( aa \) x man \( Aa \)  
B. woman \( AA \) x man \( aa \)  
C. woman \( Aa \) x man \( AA \)  
D. woman \( Aa \) x man \( aa \)

28. Free earlobes are dominant over attached earlobes. If two people with attached earlobes mate, what will be the phenotype of their offspring?

A. all free earlobes  
B. all attached earlobes  
C. 50/50 free to attached earlobes  
D. 75% free, 25% attached

29. If 25% of the offspring of one set of parents show the recessive phenotype, the parents were probably:

A. both homozygous recessive  
B. both homozygous dominant  
C. both heterozygous  
D. one homozygous dominant, one homozygous recessive
30. When one trait is governed by two or more sets of alleles, this is called:

A. polymorphism  
B. polyploidy  
C. polygenic inheritance  
D. apoptosis  
E. None of the choices are correct.

31. A 9:3:3:1 phenotypic ratio is expected from a dihybrid cross when

A. both parents are homozygous.  
B. both parents are heterozygous.  
C. one parent is homozygous dominant for each trait and one parent is heterozygous for each trait.  
D. one parent is homozygous dominant for each trait and one parent is homozygous recessive for each trait.

32. Freckles and a widow's peak hairline are dominant traits. A man without freckles and a straight hairline has a child with a woman who has freckles and a straight hairline. What are the chances the child will have the same phenotype as the father?

A. 50% if the mother is heterozygous for freckles.  
B. 0% if the mother is homozygous for freckles.  
C. 25% if the father is heterozygous for each trait.  
D. either 50% or 0% depending on mother's genotype.

33. Dimples and short fingers are dominant. If a child does not have dimples and has long fingers, then both his parents must also have dimples and have long fingers.

A. True  
B. False

34. When a gene exists in several allelic forms, but each person has only two of the forms, this is called:

A. polygenic inheritance  
B. multiple alleles  
C. codominance  
D. sex-linked  
E. None of the choices are correct.
35. In a paternity suit the alleged father has blood type O, the mother blood type AB, and the baby has blood type B. Choose the most accurate statement below.

A. The alleged father must be the biological father.
B. The alleged father could be the biological father.
C. The alleged father could not be the biological father.
D. None of the parental blood types match the baby.

36. In a paternity suit the alleged father has blood type AB, the mother blood type O, and the baby has blood type O. Choose the most accurate statement below.

A. The alleged father must be the biological father.
B. The alleged father could be the biological father.
C. The alleged father could not be the biological father.
D. None of the parental blood types match the baby.

37. When alleles are equally expressed in a heterozygote it is called:

A. sex-linked
B. incomplete dominance
C. codominance
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38. When a heterozygote has an intermediate phenotype between that of either homozygote, it is called:

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39. Inheritance of skin color is considered polygenic. If two medium-brown individuals married (AaBb × AaBb), the resulting children may be:

A. very light
B. very dark
C. medium-brown
D. dark
E. any of the choices
40. Traits controlled by alleles on the sex chromosomes (X or Y) are said to be:

A. sex-linked  
B. incomplete dominance  
C. codominance  
D. multifactorial inheritance  
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41. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a female with normal vision, but is a carrier of the color blind gene.

A. $X^B X^B$  
B. $X^B X^b$  
C. $X^b X^b$  
D. $X^B Y$  
E. $X^b Y$

42. Color blindness is an X-linked genetic disorder. Choose the following genotype that represents a male who is color blind.

A. $X^B X^B$  
B. $X^B X^b$  
C. $X^b X^b$  
D. $X^B Y$  
E. $X^b Y$

43. Color blindness is an X-linked genetic disorder. If a man with normal vision and a heterozygous woman have a daughter, what are the chances that she will be color blind?

A. 0%  
B. 25%  
C. 50%  
D. 75%  
E. None of the choices are correct.

44. The gene which is responsible for red/green colorblindness is located on which type of chromosome?

A. autosome  
B. X chromosome  
C. Y chromosome
45. In ___, one set of alleles controls the phenotype with one allele coding for a product while the other does not, giving the heterozygote an intermediate condition.

A. multiple alleles  
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46. Parents that appear normal but are capable of having a child with a genetic disorder are called:

A. harbingers  
B. carriers  
C. genetic hosts  
D. chimeras  
E. None of the choices are correct.

47. Which of the following genetic diseases is prominent in individuals of Jewish descent?

A. Tay-Sachs  
B. PKU  
C. cystic fibrosis

48. Which if the following genetic diseases results from the lack of an enzyme needed to break down the amino acid phenylalanine?

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49. Which of these characterizes PKU?

A. inheritance of autosomal recessive alleles  
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50. A person with the sickle-cell trait:
   A. gets this condition from one parent
   B. has red cells that are sometimes sickle-shaped
   C. does not need to restrict physical activity
   D. All of the choices are correct.

51. Which disorder is characterized by a lack of the protein dystrophin?
   A. hemophilia
   B. color blindness
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52. Which of the following is expected to be more common in male offspring than female?
   A. hemophilia
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   C. Huntington disease

53. Which of the following is inherited as an X-linked recessive trait?
   A. Tay-Sachs
   B. sickle cell anemia
   C. cystic fibrosis
   D. hemophilia

54. Hemophilia A is caused by the absence of
   A. hemoglobin
   B. clotting factor VIII
   C. blood plasma
   D. dystrophin

55. Hemophilia is a(n) _________ disease.
   A. sex-linked
   B. autosomal dominant
   C. polygenic
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   e. X^b Y

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D. both inheritance of autosomal recessive alleles and the inability to metabolize phenylalanine.

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b.  sickle cell anemia
c.  cystic fibrosis
D  hemophilia

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B  clotting factor VIII
c.  blood plasma
d.  dystrophin

55. Hemophilia is a(n) _________ disease.

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b.  autosomal dominant
c.  polygenic
d.  autosomal recessive
### chapter 20 Summary

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