BSCS Biology Chapter 13 Exam

1. Will fraternal twins raised in different families exhibit the same trait more often than identical twins or more often than nontwin siblings, or less often than nontwin siblings or just as often as nontwin siblings – each raised in separate families?

2. True or False: [If false make true.] Unlike alleles in a population contribute to mutations.

3. Genes [which are sequences of nucleotides] may code for _____.

4. What determines the function of a protein?

5. What is the name of the gene pairs in which parents contribute one of two genes for a particular trait?

6. Describe a eukaryotic chromosome.

7. Describe the similarities between prokaryotic and eukaryotic chromosomes?

8. How can specific chromosomes be distinguished from one another?

9. What is the primary goal of the Human Genome Project?

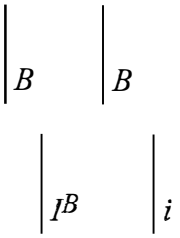
10. What is the purpose for genetic testing for a disease-linked gene?

11. There will be three probability questions. For example: A coin is tossed three times. Give the probability it lands heads up all three times?

12. Give the reason Mendel discovered the principles of inheritance.

13. Looking at the diagram below, which are alleles?

The diagram below shows the genes for eye color *(B, b)* and blood type *(I^A, I^B, i)* in a cell. The lines represent chromosomes; the letters represent genes.



14. Discuss Mendel's experiment with pea plants. Include in your discussion the percent of offspring of the F_1 cross which produced yellow pods; what Mendel suggested about the yellow trait and its lack of appearance, and recessive v dominant traits, homozygous v heterozygous.

What is the chance a couple with two children has a boy and a girl?

15. What happens to alleles during gamete formation in a diploid organism?

16. Define the principle of segregation.

17. Name the step in meiosis which corresponds to Mendel's principle of segregation.

18. Be able to make Punnett Squares to answer two [2] questions. [PRACTICE]

19. If three-quarters of offspring from experimental crosses showed only recessive traits the parents were _____. Conversely, if three-quarters of offspring from experimental crosses showed only dominant traits the parents were _____.

20. Two questions on the following scenario [w/regard to genotypes]: A breeding experiment using guinea pigs was conducted. The gene for rough coat [R] is dominant to the gene for smooth coat [r]. A smooth-coated guinea pig was bred to a rough-coated guinea pig and had seven smooth-coated and eight rough-coated offspring.

21. What determines the genetic makeup of an organism for a particular trait?

22. Why do chromosomes in the nucleus appear to behave like genes?

23. Name the genotypes which cannot be determined by inspecting the phenotypes of offspring of a cross.

24. Homozygous red-flowered plant was crossed with a white-flowered plant. All offspring were red-flowered [F_1 generation]. This means the gene for red flowers must have been _____.

25. Three questions based upon this scenario: One hundred seeds are produced by cross-pollinating two green plants. Half of these seeds are grown in the dark at 35 degrees C, the other half in the light at 35 degrees C. At the end of the experiment, it is observed that all seedlings growing in the dark are white; of the seedlings growing in the light, 78% are green and the rest are white.

26. Question on determining phenotype. Example: L=long, W=wrinkled, B=black, Y= yellow R= ribbed, g=short, w=smooth, y=white, r=grooved. Provide the genotype for a short, wrinkled, yellow, grooved seed.

27. Three [probability] questions based on the following scenario: Tay-Sachs disease is a fatal genetic disorder caused by an allele for a recessive trait. Children born with this disorder usually die before the age of five. A couple has had three children who died of Tay-Sachs disease.

28. Three [probability] questions based on the following scenario: Tay-Sachs disease is caused by an allele for a recessive trait. A DNA test on blood can determine if a healthy individual is homozygous or heterozygous. One member of a particular couple is homozygous dominant, and the other member is heterozygous.

29. There is a defective gene located on the X chromosome. Transmission to a female can be only from:

a. mother
b. father
c. either, or
d. only by mistake

30. If there is a defective gene on the X chromosome, how could this be transmitted to a male?

31. Who determines the sex of a human child?

32. Four questions based on the chart below.

Chromosome pattern	Fruit fly	Chicken	Human
X	male		female
XX	female	male	female
XY	male	female	male
XXX	female		female
XXY			

33. In 1988, a Florida couple charged a hospital with baby swapping, claiming that the baby they brought home was not their biological daughter. The father and the baby had type B blood, the mother type O. In terms of blood type, could the baby have belonged to this couple?

34. Can a person with type A blood safely receive a transfusion of type O blood?

35. Why are blood types sometimes incompatible when blood-group matching for transfusions?

36. What causes the clumping when incompatible blood types are mixed?

37. Define pedigree, multiple alleles, and codominance.

38. Four questions [dealing with phenotype, genotype, mode of inheritance] based upon the following scenario: Tallness [T] is dominant to dwarfness [t], while red flower color is due to gene [R] and white to its allele [r]. The heterozygous condition results in pink [Rr] flower color. A dwarf red snapdragon is crossed with a plan homozygous for tallness and white flowers.

39. Four questions [dealing with possible parent probability of blood type] based upon the tables listed below.

Blood type	Genotype
A	I^AI^A or I^Ai
B	I^BI^B or I^Bi
AB	I^AI^B
O	ii

Three babies were mixed up in a hospital. The blood types of the parents and babies are shown below.

Parents I	A and B
Parents II	A and A
Parents III	AB and O
Baby 1	B
Baby 2	O
Baby 3	AB

40. Two questions based upon the graph below.

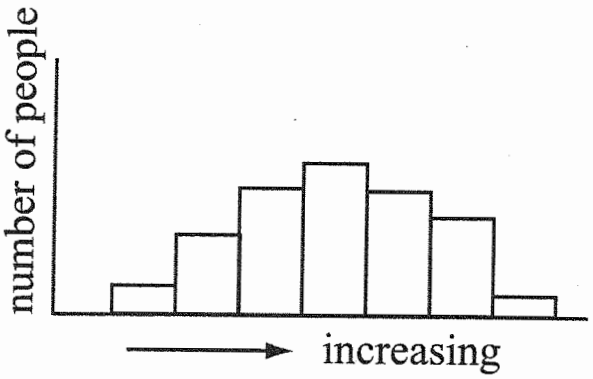


Figure 13.01

41. The greater the chance that a break occurs between linked genes, the _____ the distance between the genes.

42. Name the parental genotypes that would result in children who are all normal-vision daughters and all color-blind sons. [B=allele for normal color vision; b=allele for color blindness] [Color blindness is an X-linked recessive condition.]

43. What is the mechanism of inheritance by which a trait would always be transmitted from father to son but never occur in a female.

44. Define an X-linked trait.

45. Three questions [on genotype for individuals] based upon the pedigree figure below.

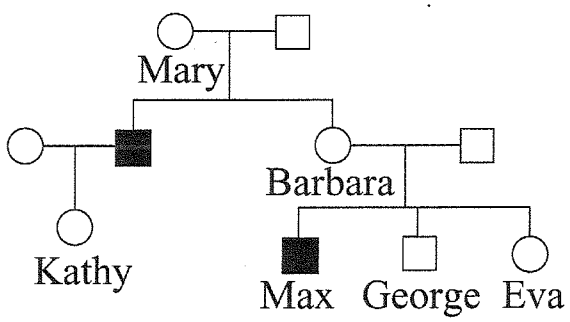


Figure 13.03

46. Four questions on the number of Barr bodies that would be expected in normal male, normal female, female with XO or XXX, XXY or XYY male.

47. Define:
nondisjunction
multiple–allel traits
multifactorial traits
discontiuous distribution
continuous distribution