Honors Biology Test
Chapter 9 - Genetics

1. The exceptions to the rule that every chromosome is part of a homologous pair are the
   a. sex chromosomes. c. linked chromosomes.
   b. autosomes. d. linked autosomes.

3. In codominance, the alleles for both traits
   a. blend. c. combine.
   b. are not expressed. d. are expressed.

5. In the alleles that determine blood type,
   a. A and B are codominant. c. B and O are codominant.
   b. A and O are codominant. d. O is dominant.

8. Which of the following descriptions of Mendel is **incorrect**
   a. He was simply lucky to work out the laws of genetics.
   b. He focused on contrasting phenotypic characteristics.
   c. He demonstrated that the blending theory of inheritance was wrong.
   d. He kept exact mathematical data and was the first scientist to use mathematical analysis of breeding results.
   e. He was a monk, and a gardener

13. According to Mendel, what kind of genes "disappear" in the F1 generation organisms?
   a. sex-linked c. dominant
   b. recessive d. codominant

14. Given the parents AABBCC x AabbCc, assume simple dominance and independent assortment. What proportion of the progeny will be expected to phenotypically resemble the first parent?
   a. 1/4 b. 1/8 c. 3/4 d. 1

15. In cocker spaniels, black coat color (B) is dominant over red (b) and solid color (S) is dominant over spotted (s). If a red male was crossed with a black female to produce a red spotted puppy, the genotypes of the parents (with male genotype first) would be
   a. BbSs X BbSs c. bbSs x BbSs
   b. bbss X BbSs d. bbSs x Bbss

16. A sexually reproducing animal has two genes, one for head shape and one for tail length. Its genotype is HhTt. Which of the following genotypes is possible in a gamete from this organism?
   a. HT b. Hh c. HhTt d. tt

17. A albino father and a normal mother have one albino child. (being albino is caused by a recessive allele a)The couple decides to have a second child. What is the probability that this child will be albino?

a. zero b. 1/4 c. 1/2 d. 3/4

18. The mother is now pregnant for a third time, and her doctor tells her she is carrying fraternal twins. What is the probability that both children will have normal pigmentation?
a. 3/4 b. 1/4 c. 1/16 d. 9/16

19. A 9:3:3:1 phenotypic ratio is characteristic of the
a. F1 generation of a monohybrid (1 trait) cross.
b. F2 generation of a monohybrid cross.
c. F1 generation of a dihybrid (2 trait) cross.
d. F2 generation of a dihybrid cross.

20. How many unique gametes could be produced by an individual with the genotype AaBbCCDdEE?
a. 4 b. 8 c. 16 d. 32

21. In a dihybrid cross, the expected proportion of offspring showing both recessive traits is
a. 1/16. b. 3/16. c. 9/16. d. 1/4.

22. Which organism did Mendel use to work out the laws of segregation and independent assortment:
a. fruit flies c. Neurospora
b. Garden Peas d. E. coli

23. If tall (D) is dominant to dwarf (d), and two homozygous varieties DD and dd are crossed, then what offspring will be produced?
a. all medium height c. all tall
b. all dwarf d. ½ tall, ½ dwarf

24. Mendel's principle of independent assortment states that
a. one allele is always dominant to another
b. hereditary units from the male and female are blended in offspring
c. the two hereditary units that influence a certain trait segregate during gamete formation.
d. Each hereditary unit is inherited separately from other hereditary units.

25. If all the offspring of a cross have the genotype Aa, the parents of the crosses would most likely be
a. AA x aa c. Aa x Aa
b. Aa x aa d. AA x Aa

27. Genes that affect or control the expression of another set of genes are said to be
a. Epistatic c. Llinked
b. Codominant d. Alleles

29. The fact that all seven of the garden pea traits studied by Mendel obeyed the principle of independent assortment means that the
a. haploid number of garden peas is 7.
b. diploid number of garden peas is 7.
c. seven pairs of alleles determining these traits are on the same pair of homologous chromosomes.
d. seven pairs of alleles determining these traits behave as if they are on different chromosomes.

30. If an AaBbCc parent is crossed with an AaBbCC parent what is the probability that they will have an offspring who shows all dominant traits?
a. 1/8 b. 1/32 c. 1/16 d. 9/16 e. 9/32

31. Mendel's law of independent assortment states that
a. genes sort independently of each other in animals but not in plants
b. chromosomes sort independently of each other during mitosis and meiosis.
c. each pair of alleles segregates independently of the other pairs of alleles during gamete formation
d. independent sorting of genes produces polyploid plants under some conditions.

32. What is a test cross?
a. a mating between an individual of unknown genotype and an individual heterozygous for the trait of interest
b. a mating between two individuals heterozygous for the trait of interest
c. a mating between an individual of unknown genotype and an individual homozygous recessive for the trait of interest
d. a mating between an individual of unknown genotype and an individual homozygous dominant for the trait of interest

32. Refer to the pedigree chart below for a family, some of whose members exhibit the recessive trait, wooly hair. Fill in the Genotypes of as many individuals as possible, leaving a blank where you are unable to figure out an allele.

33. Explain how to distinguish between complete dominance, incomplete dominance, and codominance. How do you recognize a trait as showing polygenic inheritance? (5 points)

34. You find a male tribble that has blue plaid fur. When you cross this male with a purebred solid blue female, all the offspring are solid blue in color. A cross between two of these offspring produces 3/4 solid blue and 1/4 blue plaid. All of the blue plaid tribbles are male.

    a. How is plaid fur inherited in tribbles (Assume sex determination is the same in tribbles as in humans) ? Explain how you know this. (3 points)

    b. What cross would produce offspring that are 1/2 solid blue and 1/2 blue plaid? (2 points)

35. Name and describe an autosomal recessive human disease. Name and describe an X linked recessive human disease. (4 points)