1. In dogs, black fur color is dominant to white. Two heterozygous black dogs are mated. What would be the probability of the pups four with black fur and two with white fur?
   A. 0.297 B. 0.321 C. 0.545 D. 0.012 E. 0.789

2. Summer squash come in three shapes: disk, spherical and elongate. In one experiment researcher crossed two squash plants with disk-shaped fruits. The first 160 seeds planted from this cross, produced plants with fruit shapes as follows: 89 disk, 61 sphere and 10 elongate. What is the mode of inheritance of fruit shape in summer squash?
   A. autosomal dominant B. epistatic C. autosomal recessive D. X-linked

3. If two black mice were crossed, ten black and three white mice result. What are the genotypes of the parents?
   A. Bb and Bb B. BB and bb C. Bb and BB D. BB and BB

4. The offspring of two phenotypically normal people who are heterozygotes for albinism would be expected to exhibit which phenotypic ratio of normal to affected individuals?
   A. 3:1 B. 1:1 C. 1:2:1 D. 1:3 E. 4:0

5. The probability that two parents will have first three girls and next one boy in their family may be determined using the
   A. product rule B. sum rule C. student t test D. chi-square

6. The probability that two parents will have first three girls and next one boy in their family is
   A. ½ B. ¼ C. 1/8 D. 1/16 E. 1/32

7. In humans, brown eye color (B) is dominant to blue eyes (b). Two parents with brown eyes have a large family of 24 children. 18 of the children have brown eyes and 6 of them have blue eyes. Then parents genotypes are
   A. BB and bb B. Bb and bb C. BB and Bb D. Bb and Bb

8. In humans, albinism is a recessive trait characterized by a lack of pigment in the skin and eyes. An albino woman marries a man with normal skin pigmentation whose mother was an albino. What percentage of their offspring are expected to be albino?
   A. 0% B. 25% C. 50% D. 75% E. 100%

9. Coat color in rodents is determined by a gene interaction between two genes. If a true-breeding black rat is crossed to a true-breeding albino rat, the result is a rat with agouti (brownish/dark gray) coat color. If two agouti animals of the F1 generation are crossed to each other, they produce agouti, black, and albino animals in a 9:3:4 ratio. What is the pattern of inheritance for this trait?
   A. autosomal recessive B. autosomal dominant C. epiststic

10. A couple has four children. Neither the father nor the mother is bald; one of the two sons is bald, but neither of the daughters is bald. If one of the daughters marries a nonbald man and they have a son, what is the chance that the son will become bald as an adult?

A. 1/4 B. 1/2 C. 1/8 D. 1/16 E. 1/18

11. The autosomal dominant trait brachydactyly is a condition characterized by short, stumpy fingers and toes; however, the symptoms are not always expressed in individuals that carry the dominant allele. The brachydactyly allele is

A. co-dominant B. incompletely dominant C. incompletely penetrant
D. epistatic E. completely dominant

12. Members of a family have a condition in which the second toe is longer than the big toe. The trait is found in every generation, but it does not always appear in family members with the associated genotype. In some people, the second toe is longer on both feet; in others only one foot has the affected toe. This gene is

A. dominant B. incompletely penetrant C. variably expresed
D. all of the above E. none of the above

13. Some fruit flies that are homozygous for the recessive eyeless gene have no eyes, while others have eyes that are smaller than normal. Still others have completely normal eyes. This indicates that the eyeless gene is

A. epistatic B. completely penetrant C. co-dominant
D. incompletely dominant E. variably expressed

14. In pea plants, the smooth seed allele is dominant to the wrinkled seed allele. The F1 generation resulting from a mating between a true-breeding pea plant bearing smooth seeds and one bearing wrinkled seeds would show which phenotype

A. 1/2 smooth seeds and 1/2 wrinkled seeds B. all smooth seeds
C. all wrinkled seeds D. 3/4 wrinkled and 1/4 smooth

15. In a test cross between an individual with an unknown genotype that exhibits the dominant phenotype, and a known homozygous recessive individual, the progeny showed a 1:1 ratio of dominant to recessive phenotypes. The individual of unknown genotype is therefore ---------

A. hemizygous B. homogeneous C. homozygous D. heterozygous