Quiz 4 Key (Ave 85, High 100 (many), Low 50 (many))
BI-102, Fall '08, Dr. C. S. Tritt

This is a 3 question test. Questions 1 and 3 are worth 30 points each while question 2 is worth 40 points. Write you answers on the paper provided and put you name on each page. Also put you name on this page and turn it in with your answers.

1. A man with type A blood and a women with type B blood have children with the following blood types: AB, B and O. Tell me as much as you can about the genotypes of these parents.

The man's genotype could be I^AI^A or I^Ai. The woman's genotype could be I^BI^B or I^Bi. The presence of the child with type O blood (genotype *ii*), requires that the man be I^Ai and the woman be I^Bi.

2. In my spare time, I've been breading and studying MSOE camels. In particular I've determined their eye colors are determined by just 2 genes. One of these genes controls the brownness of animals' eyes. This gene has 2 alleles. I call them B (the dominant form that results in brown eyes) and b (the recessive form that results in blue eyes). The other gene controls the greenness of their eyes. This gene also has 2 alleles. I call them G (the dominant form that results in green eyes) and g (the recessive form that results in blue eyes). These genes assort independently (they're not linked). Also, B is epistatic with respect to G and g meaning that B with either of these results in a brown eyed animal. Similarly, G is epistatic with b in that G with b results in green eyed animals.

   Now for the problem, predict the ratio of eye colors in the F_2 offspring when true breeding brown eyed animals that are known to be homozygous recessive (g) for the greenness gene are crossed with true breeding green eyed animals and the resulting F_1 animals are self-crossed.

The true breeding brown eyed animals are BBgg and the green eyed ones are bbGG. As a result all the F1 offspring are BbGg (brown eyed). The F2 offspring are described in the following tables:

	BG	*Bg*	*bG*	*bg*
BG	(brown) *BBGG*	(brown) *BBGg*	(brown) *BbGG*	(brown) *BbGg*
Bg	(brown) *BBgG*	(brown) *BBgg*	(brown) *BbgG*	(brown) *Bbgg*
bG	(brown) *bBGG*	(brown) *bBGg*	(green) *bbGG*	(green) *bbGg*
bg	(brown) *bBgG*	(brown) *bBgg*	(green) *bbgG*	(blue) *bbgg*

So the ratios are 12:3:1 (brown:green:blue). Note the modified 9:3:3:1 ratio and the appearance of blue eyed animals that were not present in the parental generation.

Getting F_1 wrong (like *Bbgg*) but doing rest of problem correctly -20. Getting both F_1 and F_2 wrong and not doing squares correctly -35 to 40.

3. Explain the gifference between *XY* ang *WZ* genetic sex getermination systems ang name a specific species or general type of animal that uses each.

In the WZ system, males are homozygous (ZZ) ang females are heterozygous (ZW) with respect to the sex chromosome. This is the opposite of the XY system in which males are heterozygous (XY) ang females are homozygous (XX). As a result, in the WZ system it is the egg that gictates the sex of the offspring, rather than the sperm as in the XY system. Humans and other mammals use the XY system while birgs you the WZ system.

Not given an example -5/system.