Lab 7: Chromosomal Mutations Name:_____

Grade:_____

1. (3 marks total) Why are most polyploidy species found to have even numbers? (E.g., Why are tetraploid species almost always diploid?) (b) How would you account for the appearance of individuals with an odd number of chromosomes (that is, 3N, 5N, etc.) in series of polyploidy species with 2n = 2N, 4N, 6N, 8N?

(a) (2 marks total) Polyploids with an even number of chromosomes are more likely to form a regular meiotic than those with an odd number, and so are more likely to be fertile. (1) Chromosome number is an odd number – meiosis will produce mostly unbalanced gametes (e.g., 3 sets of chromosomes must segregate into 2 daughter cells more likely one daughter will end up with 2 chr & the other with have only one chromosome from any set of homologs. (2) mostly. This is because each set the chromosomes will have a homologous with which to pair and align at the metaphase plate during meiosis 1. Many combinations of unequal number of chromosomes will occur. (2 mark)

b) (1 mark) These specimens represent the occasional exceptions. For instance, the one with 3N chromosomes would have one extra chromosome, and the one with 5N chromosomes would lack one. Meiosis/gametes would be the cause in both cases.

2. (3 marks total) The following chromosomes are related to each other by a series of inversions and are listed in the order in which they occur. For each of these changes, indicate on the preceding chromosome (the one above) the breakpoints that would give rise to each inversion.

1 = A B C D E F * G H I J

2 = A B F E D C * G H I J

3 = A B F E D G * C H I J

4 = A B F E H G * D C I J

These inversions are overlapping:

5 = A B G E D C F H * A H I J

6 = A B D E G F C H * A H I J

7 = A B F E H G D C * A H G I J

8 = A B F E H G * B C D I J B J

9 = A B F E H G * I D C J

3. (3 marks total) Distinguish between pseudodominance, pseudogenes, and pseudohomologs.