

## **Problem Set 1**

**1. Name 4 important differences between mitosis and meiosis**

**2. What does “alternation of haploid and diploid generations” refer to?**

**3. The frequency of allele  $A$  is 0.6 and the frequency of the allele combination  $AB$  is 0.2. What is the probability that an individual with allele  $A$  also has allele  $B$ ?**

**4. The frequency of allele  $A$  in a population is 0.6. You sample 10 individuals from the population. What is the probability that 6 of them will have allele  $A$ ?**

**5. In garden peas, height is determined by a single gene with tall being dominant to short. If two heterozygous plants are crossed, what proportion of the tall progeny will be homozygous dominant?**

**6. In humans pointed eyebrows are dominant to smooth eyebrows and widow's peak (downward pointed frontal hairline) is dominant to continuous hairline. What phenotypic ratio would you expect in the offspring from a cross between an individual heterozygous for both genes and an individual homozygous recessive for both genes?**

**7. Individuals with  $CC$  or  $Cc$  genotypes have crumbly earwax. Individuals with  $cc$  genotypes have gooey earwax. On Paradise Island there are 100 people, 25 of whom have gooey earwax. Assuming Hardy–Weinberg conditions, what is the frequency of the  $c$  allele on Paradise Island?**