

**BIO 184 - PAL Problem Set Lecture 7 (Brooker Chapter 3)  
Reproduction and Chromosome Transmission**

**Section A. Mitosis and meiosis steps and purpose**

**List the step names of mitosis in the correct order.**

**What is overall purpose of mitosis?**

**Do bacteria undergo mitosis? Why or why not?**

**Do mitochondrial and chloroplast DNA undergo mitosis? Why or why not?**

**List the step names of meiosis in the correct order.**

**What is the overall purpose of meiosis?**

**Do bacteria undergo meiosis? Why or why not?**

**Do mitochondrial and chloroplast DNA undergo meiosis? Why or why not?**

**During what phase of the cell cycle do chromosomes start to condense?**

**During what phase of the cell cycle does the nuclear membrane start to disassociate?**

**During what phase of the cell cycle do the sister chromatids separate?**

**During what phase of the cell cycle do microtubules assemble?**

**When do homologous chromosomes separate from one another and move to opposite poles?**

## **Section B. Sisters and homologs**

**What is the difference between sister chromatids and homologous chromosomes?**

**Where does an individual obtain its pairs of homologous chromosomes?**

**How much sequence similarity is shared between two homologous chromosomes?**

**During what phase of the cell cycle do sister chromatids form?**

**How much sequence similarity do two sister chromatids share?**

**Do two sister chromatids contain different alleles?**

**What does the term “locus” mean?**

### **Section C. Crossing-over**

**What is the general purpose of the synaptonemal complex?**

**When and where does crossing over occur most frequently?**

**What is the result of one cross over event? Two events? Three events?**

**Do you contain single recombinant chromosomes containing parts of both your parents' chromosomes?**

**Do you contain single recombinant chromosomes containing parts of both your paternal grandparents'?**

**Do you contain single recombinant chromosomes containing parts of both your maternal grandparents'?**

**Do you contain single recombinant chromosomes containing parts of both your paternal and maternal grandparents'?**

#### **Section D. Meiosis and sex**

**What is the result of Meiosis I? Meiosis II? How does this compare to mitosis?**

**If a diploid organism has 24 pairs of chromosomes, how many chromosomes will its gametes have?**

**From an evolutionary standpoint, what is the purpose of sex?**

**How do bacteria evolve without sex?**

**What is spermatogenesis?**

**Is cell division symmetrical or asymmetrical? What does that mean?**

**How many sperm cells are generated during spermatogenesis?**

## **What is oogenesis?**

**Is cell division symmetrical or asymmetrical? What does that mean?**

**How many egg cells are generated during oogenesis?**

**What are polar bodies?**

**How many polar bodies are generated during oogenesis?**

**When an egg is released from the ovary in humans, has it completed meiosis prior to fusion during fertilization?**

**Who do we inherit our mitochondrial DNA from? Why?**