

Biology 1001 Exam 2 Review

This exam will cover chapters 9-13. The exam will 40 questions multiple choice. I will provide a Scantron for you. Please bring your student ID and a number 2 pencil to take the exam.

Chapter 9 Review:

1. What is DNA?
 - **Hereditary information in cells**
2. What is DNA composed of?
 - **Nucleotides (phosphate, sugar and a base)**
 - **Linked by hydrogen bonds**
3. What is a chromosome?
 - **Contains DNA and a protein**
 - **Passed on during sexual reproduction**
4. What are genes?
 - **Segments of DNA that contain traits passed down to offspring**
5. How do the bases in DNA pair (i.e. A-T, G-C)?
 - **A & T, C & G**
6. What is the cell cycle?
 - **Repeating pattern of dividing, growing, and differentiating then dividing again**
7. What happens in each phase of the cell cycle?
 - **Prophase- chromatin condense and nucleolus disappears**
 - **Metaphase- chromosomes line up in the middle of the cell**
 - **Anaphase- paired chromosome separate and begin moving to opposite sides of the cell**
 - **Telophase- cell splits in two**
8. What is the difference between mitosis and meiosis?
 - **Mitosis happens to all cells**
 - **Meiosis only occurs in sexual reproduction**
9. What is a gamete?
 - **Gamete- a haploid sex cell, usually a sperm or an egg, formed in sexually reproducing organisms**
10. What are homologous chromosomes?
 - **Homologous chromosomes- chromosomes that are similar in appearance and genetic information when they pair together in meiosis (contain the same gene)**
11. What is a mutation?
 - **Mutation- a change in the base sequence of DNA in a gene; often used to refer to a genetic change that is**

significant enough to alter the appearance or function of the organism

12. Are mutations beneficial or harmful?
- **It depends; some mutations are beneficial and are responsible for the evolution of organisms, some are benign, and some are harmful to an organism's genetic makeup**

Chapter 10 Review:

1. What are alleles?
 - **Allele- one of several alternative forms of a particular gene**
 - **Caused by mutations**
2. How can mutations be passed down?
 - **If a mutation occurs in the cells that become sperm or eggs, it can be passed on from parent to offspring**
3. What does homozygous and heterozygous mean?
 - **Homozygous- carrying two copies of same allele of a given gene (purebred)**
 - **Heterozygous- carrying two difference alleles of a given gene (hybrid)**
4. What experiment did Gregor Mendel perform?
 - **He cross-bred pea plants to see which colors the offspring would be**
 - **Discovered essential facts about the distribution of alleles in sexual reproduction**
5. How can you determine the sex of the offspring (i.e. the Punnett square)?
 - **Use the Punnett square to cross-reference a certain gene from both the male and the female**
6. What is a pedigree in terms of recessive and dominant genes?
 - **Pedigree- a diagram showing genetic relationships among a set of individuals, normally with respect to a specific genetic trait**
7. What is an X-linked trait?
 - **Also called sex-linked**
 - **Dominant in females because they have two X chromosomes**
 - **Females show the dominant trait unless they are homozygous recessive**
 - **Males show whatever allele, dominant or recessive, is found on their one X chromosome**

8. What is nondisjunction?
 - **Incorrect separation of chromosomes or chromatids**
 - **Causes gametes to have too many or too few chromosomes**
9. What is Turner syndrome?
 - **Occurs in females with only one X chromosome (X0)**
 - **Stops puberty; infertility; stunted growth**
 - **Makes women more susceptible to sex-linked disorders**
10. What is Klinefelter syndrome?
 - **Occurs in men with an extra X chromosome (XXY)**
 - **Infertility; mixed secondary sexual characteristics (growing partial breasts, small testes, etc.)**

Chapter 11 Review:

1. What experiment did Griffith perform?
 - **Worked with two strains of *Streptococcus pneumoniae***
 - **S-strain → pneumonia**
 - **R-strain → no pneumonia**
 - **Heat-killed S-strain → no pneumonia**
 - **Heat-killed S-strain + R-strain → pneumonia (and death)**
 - **Something in the heat-killed S-strain affected the benign R-strain and made it turn deadly (transformation)**
2. What is Chargaff's rule?
 - **The amount of A in DNA must equal the amount of T; the amount of C must equal the amount of G**
3. What is the origin of the structure of DNA?
 - **DNA is a double helix**
 - **Franklin and Wilkins: discovered the structure of DNA through x-ray diffraction**
 - **It is long and thin**
 - **It is helical**
4. What did Watson and Crick do?
 - **Watson and Crick took Franklin and Wilkin's research and built a model of DNA**
 - **Discovered DNA is made of two strands of nucleotides**
 - **Sugar-phosphate backbone**
5. Know how to replicate DNA.
 - **Example: ATTCGAG → TAAAGCTC**
6. Know how to transcribe DNA.
 - **Example: ATTCGAG → UAAAGCUC**