

SPRING FINAL EXAM REVIEW

The final exam is a cumulative exam, covering information from the entire semester. It is composed of **90 multiple-choice** questions and **one free response question**. Use this review in addition to ALL MATERIAL covered in class to adequately prepare for your final exam.

UNIT 6- Cell Cycle, Cell Differentiation, & Meiosis

Cell Cycle

1. In addition to **too much demand placed on DNA**, list two problems that occur when cells increase in size.
2. When during the cell cycle are chromosomes visible?
3. Describe what occurs during G1, S and G2 phases
4. What are the two stages of **cell division**?

Phases of Mitosis

5. List the phases in order and describe what takes place in each phase. ****Be able to correctly identify cells in the various phases of mitosis.**
6. What is a centromere?
7. What is the role of the Spindle/ spindle fibers during mitosis?
8. What are cyclins?
9. What is cancer?

Cell Differentiation

10. What is cell differentiation?
11. What factor is most influential in controlling cell differentiation?
12. Describe the roles of external regulators.

Meiosis

13. If an organism has a diploid number of 24, what is the haploid number?
14. Draw a representation of crossing over.
15. When do chromosomes form tetrads?
16. Compare and contrast mitosis and meiosis.
17. Why are gametes haploid cells?

Unit 7- Genetics & Mutations

1. Define Gene.
2. Define Homozygous.
3. Define Heterozygous.
4. Define Gamete.
5. Define Codominance AND give an example.
6. Define Incomplete Dominance AND give an example.
7. What are some examples of polygenic traits?
8. Define Genotype & Phenotype.
9. Define Sex-linked traits.
10. What did Gregor Mendel use pea plants to study?
11. List three things that Punnet squares show.
12. Be able to identify the completed karyotype (47 XX + 17) when given a karyotype analysis.
13. Be able to correctly identify different types of gene mutations (Substitutions and Frameshifts- Insertions & Deletions) when given a mutated gene sequence.
14. Explain why some mutations affect the amino acid sequence in protein synthesis while others do not.
15. List three ways that a pedigree chart can be used.

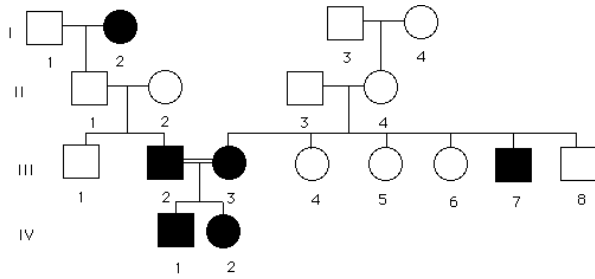
Use the dihybrid table below to answer the questions that follow:

A heterozygous pea plant with purple flowers, and smooth pea texture (PpSs) was crossed with another heterozygous pea plant for the same trait (PpSs)

| | | PpSs | | | | |
|------|----|------|------|------|------|---|
| | | PS | Ps | pS | ps | |
| PpSs | PS | PPSS | PPSs | PpSS | PpSs | Flower Color P = Purple p = yellow |
| | Ps | PPSs | PPss | PpSs | Ppss | |
| | pS | PpSS | PpSs | ? | ppSs | Pea Texture S = smooth s = wrinkled |
| | ps | PpSs | Ppss | ppSs | ppss | |

16. Write the **phenotype** of the offspring represented by the **question mark**.
17. Write the **genotype** of the offspring represented by the **question mark**.
18. How many of the offspring would be expected to be **yellow and wrinkled**?

Use the pedigree chart below to answer the questions that follow.

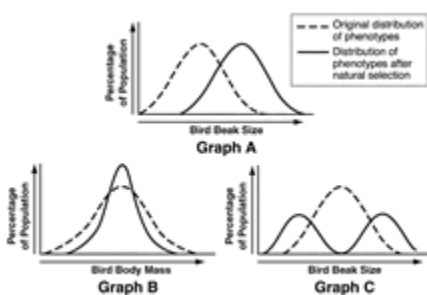


| | Normal | Albino |
|--------|--------|--------|
| Male | □ | ■ |
| Female | ○ | ● |

19. Is individual II-1 homozygous or heterozygous for normal pigment? Explain.
20. How many children of individuals II – 3 and II – 4 have albinism?
21. Are any of the offspring for individuals I-1 and I – 2 homozygous for normal pigment? If so, which ones?

Unit 8-Evolution, Taxonomy and Classification

1. What did Charles Darwin observe while on the Galapagos Islands? Provide examples
2. State Lamarck’s theory of evolution
3. List three factors that will allow allele frequencies to remain unchanged
4. Define survival of the fittest and provide an example
5. Describe Darwin’s theory of natural selection
6. What are homologous structures? What do homologous structures explain, in terms of evolution?
7. Define fitness
8. What do all members of a population share?
9. What is a gene pool?
10. Define and give an example of behavioral isolation
11. Define and give an example of geographic isolation
12. Define and give an example of temporal isolation
13. Define binomial nomenclature, and know how to determine if two species are related based on their scientific name
14. List the order of the seven taxonomic groups (largest to smallest). Expect to answer questions like the following: Several different orders make up a _____.
15. Define taxonomy
16. Match the graph below with the type of selection, then define each type of selection

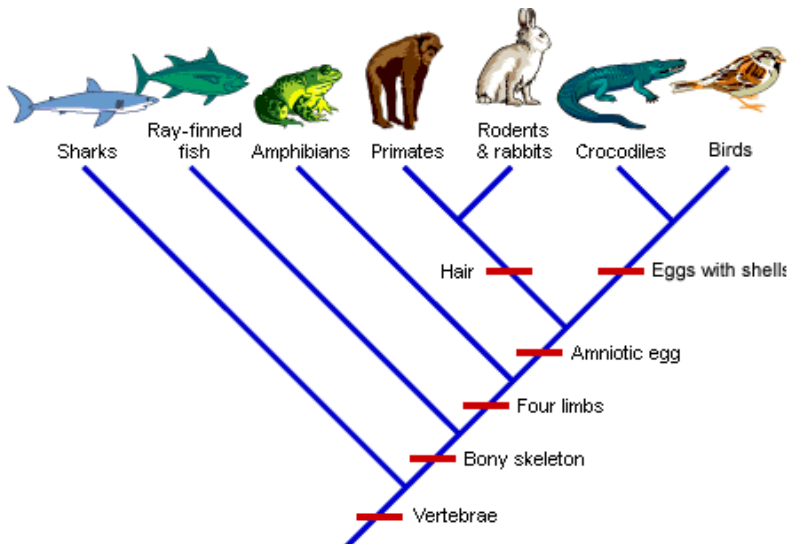


_____ Define Disruptive selection-

_____ Define Stabilizing selection-

_____ Define Directional selection-

- Define genetic equilibrium & identify three things that can disrupt genetic equilibrium in a population.
- Define and provide an example of speciation
- Study your cladogram notes and be able to interpret and answer questions about a cladogram such as the following:



- Which organism(s) do not have a bony skeleton?
- Which organism(s) have an amniotic egg?
- Which organism are the primates most closely related to?
- Which organism are the birds most closely related to?

Unit 9-Viruses & Body Systems

Viruses

- What is a capsid and what is it made of?
- Where are the instructions for making new copies of viruses found?
- Describe the lytic cycle in detail.
- Describe the lysogenic cycle in detail.
- Compare and contrast characteristics of viruses and cells. (Study and understand your notes)
- How is HIV spread?
- What specific type of cell does HIV infect?
- List the levels of organization from simplest to most complex in multicellular organisms.

Body Systems

- Know the ***functions and structures of all the body systems*** and how they interact with each other. ****Study your Systems Overview worksheet and Systems Interactions sheet.****
- What is homeostasis and why is it so important to living organisms?

Be able to answer one of the following questions thoroughly:

- Compare and contrast mitosis & meiosis.
- Compare and contrast the lytic and lysogenic infection cycles of viruses.