

**GENERAL BIOLOGY EXAM****General Instructions:**

- a. You have one hour to take the examination.
  - b. Start each answer on a separate sheet of paper. You can use more than one sheet per answer, if required. Please put the question number and page number for each answer in the space provided.
  - c. If anything is unclear, you can ask the examiner, who will contact the appropriate person for clarification.
  - d. Answer any THREE of the questions below.
  - e. All questions carry equal weight.
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1. Explain the general processes of mitosis and meiosis, and compare their products in terms of the number of cells produced, whether they are haploid or diploid, and which types of cells are involved in each (i.e. somatic or germ line).
2. Define homeostasis and its regulatory mechanisms: positive and negative feedback. Give an example of each type of feedback in relation to homeostasis, including the physiological and/or behavioral mechanisms involved.
3. Describe the “central dogma” of molecular biology using the following keywords: DNA, mRNA, tRNA, rRNA, Okazaki fragment, splicing.
4. What is meant by the expression “nature versus nurture”? Using only one of the following terms, describe how nature and nurture might both be involved: (a) intelligence; (b) communication; (c) foraging (acquiring energy and nutrients); (d) parental behavior.
5. Compare and contrast the concepts of "ecological niche" and "habitat" using examples.
6. Who was Gregor Mendel and what did he work on? Using the classic example of his work, describe Mendel’s principles of inheritance: (1) principle of unit characters; (2) principle of dominance; (3) principle of segregation; (4) principle of independent assortment.
7. Describe the molecular mechanism of Polymerase Chain Reaction (PCR).
8. What is the difference between a homologous trait and an analogous trait? Give at least one example of each.

**FIELD OF SPECIALTY EXAM****General Instructions:**

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Please put the question number and page number for each answer in the space provided.
  3. If anything is unclear, you can ask the examiner, who will contact the appropriate person for clarification.
  4. Answer any TWO of the questions below.
  5. All questions carry equal weight.
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**[Department of Ecology and Social Behavior]**

Each primate taxon has evolved unique behavioral and/or physical adaptations to obtain food and extract nutrients from food. Give one example of a behavioral adaptation and one example of physical adaptation to feeding.

**[Department of Behavioral and Brain Sciences]**

Explain what is meant by “theory of mind” with reference to one or more empirical studies.

**[Department of Evolution and Phylogeny]**

Describe morphological characteristics of anthropoid primates, and explain their ecological and behavioral implications.