# Biology Battle Individual Exam Sample Questions

Note: The sample questions below illustrate the overall structure/types of questions you may see at the Biology Battle. The questions on the official exam should be similar, but may be of slightly higher or lower, in difficulty.

Questions:

1. Which of the following organisms is INCORRECTLY paired with its trophic level?
   A) Human - tertiary consumer
   B) Beetle - secondary consumer
   C) Grass - primary producer
   D) Cyanobacteria - primary producer

2. Integral transmembrane proteins are proteins imbedded in the cell membrane. Which of the following amino acids would you MOST expect to find in the transmembrane region of such proteins?
   A) Lysine
   B) Serine
   C) Tryptophan
   D) Arginine

3. Which one of the following is made up of only one type of macromolecule?
   A) Virus
   B) Plasmid
   C) Ribosome
   D) Nucleosome

4. On a warm summer's day, the transpiration pull is the main force that drives water from root parenchyma into the root xylem. The table shows values of ψp (pressure potential) and ψs (solute potential) in root xylem and root parenchyma, in kPa. In which of the alternatives a – d would transpiration pull cause water to move from root parenchyma into the root xylem?

| | Root parenchyma | | Root xylem | |
|---|---|---|---|---|
| | ψp | ψs | ψp | ψs |
| A) | 200 | -190 | -200 | 5 |
| B) | -200 | 220 | 65 | -5 |
| C) | 200 | -220 | 65 | -5 |
| D) | 200 | -220 | -65 | -5 |

5. Which of the following would you expect of a species that has a high resting cardiac output?
   A) The animal is likely small and compact, without the need to pump blood very far from the heart.
   B) The species likely has very wide-diameter veins.
   C) The animal likely has a very long distance between its heart and its brain.
   D) The animal likely has a relatively inactive lifestyle.

6. Which of the following statements about independent assortment or segregation is correct?
   A) The law of independent assortment describes the behavior of two or more genes relative to one another.
   B) The law of segregation describes the behavior of two or more genes relative to one another.
   C) The law of independent assortment is accounted for by observations of prophase I of meiosis.
   D) The law of segregation is accounted for by anaphase of mitosis.

7. Which feature is possessed by angiosperms but not by conifers?

   A) Leaves
   B) Seeds
   C) Xylem
   D) Flowers
   E) Stomata

8. In which stage of meiosis does the chromosome number become haploid?
   A) During pairing of chromosomes in the first division of meiosis
   B) During pairing of chromosomes in the second division of meiosis
   C) When chromosomes move to opposite ends of the cell during the first division of meiosis
   D) When chromosomes move to opposite ends of the cell during the second division of meiosis
   E) During the S phase when DNA replication occurs

Answers:
1. B, 2. C, 3. B, 4. D, 5. C, 6. A, 7. D, 8. C