

Write on each one of your answer sheets:

- course name, date, number of the sheet / total number of sheets
- last name, first name, student ID

You may answer in English or Finnish.



1. Describe briefly (a couple of sentences) the following concepts:
 - a. electrodiffusion (2 p.)
 - b. ion channel gating (2 p.)
 - c. voltage-clamp technique (2 p.)
2. What are the structural differences between voltage-gated and ligand-gated ion channels? What are the primary functions of these ion channels in excitable cells? (max one page essay). (4 p.)
3. Discuss the advantages and disadvantages of different types of patch-clamp configurations (max two page essay). (6 p.)
4. Discuss different mechanisms for contributing to the maintenance of cell resting potential (max two page essay). (8 p.)