

**SGN-6057, Introduction to Cell and Molecular Biology**  
**Teacher: Marja-Leena Linne**

Write on each one of your answer sheets:

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

You may answer in English or Finnish.

1. Describe briefly the following concepts:

- gene (1p)
- DNA strand (1p)
- transcription (1p)
- amino acid (1p)
- catabolism (1p)
- systems biology

2. Discuss how the code of mRNA is “read” to produce a protein. (6p)

3. List at most six major organelles of a eucaryotic cell and describe briefly their roles in cellular function. (1p/successfully delivered item) (6p)

4. Compare “bottom-up approach” and “top-down approach” in modeling biological systems (according to Hiroaki Kitano, In: Foundations of Systems Biology, 2001). (6p)