

國立中央大學101學年度碩士班考試入學試題卷

所別：物理學系生物物理碩士班 不分組(一般生) 科目：普通生物 共 / 頁 第 / 頁
本科考試禁用計算器 *請在試卷答案卷(卡)內作答

問答題

1. A cell is the basic biological functional unit.

(A) Please draw a eukaryotic cell and label as many organelles as you know. (8分)

(B) Please indicate their size and functions. (7分)

2. What is photosynthesis? Please describe light-dependent reactions and the light-independent reactions in details. (15分)

3. Central Dogma

(A) What is the central dogma of molecular biology? (7分)

(B) Please describe how does cells make proteins from DNA in details. (Including all parts and proteins). Drawing can help. (8分)

4. Biological Classification

(A) Please list the eight major taxonomy ranks in the biological classification. (4分)

(B) What are three domains in biological classification? (6分)

(C) Could you write down the complete classification of *Homo sapiens*? (5分)

5. Could you estimate how many cells in your body? Assuming the density of your body is 1 kg/L and the average radius of human cell is 50 μm . ($\mu=10^{-6}$). (10分)

6. Cell Membrane

(A) What are the compositions of cell membrane? Please draw a figure of the structure of cell membrane. (8分)

(B) A peptide with 26 amino acids can insert into the membrane. 6 Peptides can form a pore in the membrane. Could you guess the secondary structure of this peptide and explain the reason? (7分)

7. There are intercellular and intracellular signal transductions.

(A) Could you list all of the methods of signal transduction in living organisms? (8分)

(B) Could you compare the efficiency and reliability of these methods? (7分)