

國立中央大學98學年度碩士班考試入學試題卷

所別：生物物理研究所碩士班 科目：普通生物 共 1 頁 第 1 頁

*請在試卷答案卷(卡)內作答

1. (共 30 分)

(A) (6 分) Please sorting the following items by their size (largest dimension).

(B) (24 分) Please state their importance in biology.

(a) green fluorescent protein (GFP), (b) nucleotide, (c) *Escherichia coli*, (d) red blood cell, (e) proton (H^+), (f) Enterobacteria phage T4.

2. (15 分) Protein Structure

Please list and describe 4 levels of structure for a protein

3. (20 分) A scientist did an experiment to study the 'raw material' of plants. He grew a sapling (3 kg) in a pot with 50 kg soil. He watered this tree everyday for 5 years. Then the tree becomes 30 kg and the soil remains 49.5 kg. He concludes that the increased weight of the tree comes from the water he adds in.

From your understanding of biological molecules, explain why he is misled by his own experiment. Using modern photosynthesis model to explain his experiment and re-design an experiment to study the 'raw material' of plants.

4. (20 分) What is polymerase chain reaction (PCR)? Please describe PCR principles and procedures.

5. (15 分) Write a short essay (more than 300 words) to discuss one biophysical topic that you want to study or you think the most important.

參考用