

國 立 清 華 大 學 命 題 紙

九十三學年度 原子科學 系(所) 丙 組碩士班入學考試

科目 普通生物學 科號 3704 共 1 頁第 1 頁 *請在試卷【答案卷】內作答

1. Compare the inner and outer membrane of mitochondria in term of the structure, function, and estimated protein/lipid ratio. (10%)
2. Compare the similarity and the difference between SCID and AIDS. (10%)
3. Distinguish between α and β cells in the pancreas and explain how their antagonistic hormones (insulin and glucagons) regulate carbohydrate metabolism. (10%)
4. Compare and contrast oogenesis and spermatogenesis. (10%)
5. Explain how muscles contract according to the sliding filament model of contraction and describe the processes involved in excitation-contraction coupling. (10%)
6. Distinguish between the structure and staining properties of gram-positive and gram-negative bacteria and explain why disease-causing gram-negative bacterial species are generally more pathogenic than disease-causing gram-positive bacteria. (10%)
7. Distinguish among nondisjunction, aneuploidy, polyploidy, trisomy, and triploidy; explain how these major chromosomal changes occur and describe the consequences. (10%)
8. Describe the relationship between an action spectrum and an absorption spectrum; explain why the absorption spectrum for chlorophyll differs from the action spectrum for photosynthesis. (10%)
9. Compare and contrast G-protein-linked receptors, tyrosine-kinase receptors, and ligand-gated ion channels. (10%)
10. Describe the origin and pathway of the action potential (cardiac impulse) in the normal human heart and explain why it is important that the cardiac impulse be delayed at the AV node. (10%)