

國立成功大學

111學年度碩士班招生考試試題

編 號： 267

系 所： 生理學研究所

科 目： 細胞生物學

日 期： 0220

節 次： 第 2 節

備 註： 不可使用計算機

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※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Which statements are true? Explain why and why not. The membrane potentials arise from movements of charge that leave ion concentrations practically unaffected, causing only a very slight discrepancy in the number of positive and negative ions on the two sides of the membrane (10%).
2. Which statements are true? Explain why and why not. Because the DNA double helix is only 10 nm wide---well below the resolution of the light microscopy---it is impossible to see the chromosomes in living cells without special stains (10%).
3. Which statements are true? Explain why and why not. Because a monoclonal antibody recognizes a specific antigenic site, it binds only to the specific protein against which it was made (10%).
4. Margarine (人造奶油) is made from vegetable oil by a chemical process. Do you suppose this process converts saturated fatty acids to unsaturated ones, or vice versa? Explain your answer (10%).
5. Why do signaling responses that involve changes in proteins already present in cell occur milliseconds to seconds, whereas responses that require changes in gene expression require minutes to hours? (10%)
6. Describe the structure and function of mammalian cell membrane. (9%)
7. Completely describe one of the downstream signaling of G protein-coupled receptors. (9%)
8. Briefly describe the function of the following organelles. (4 points each, totally 32%)
  - a. Nucleus
  - b. Mitochondria
  - c. Ribosome
  - d. Endosome
  - e. Lysosome
  - f. Rough endoplasmic reticulum
  - g. Smooth endoplasmic reticulum
  - h. Cytoskeleton