

國立成功大學  
110學年度碩士班招生考試試題

編 號： 58

系 所： 生命科學系

科 目： 生物化學

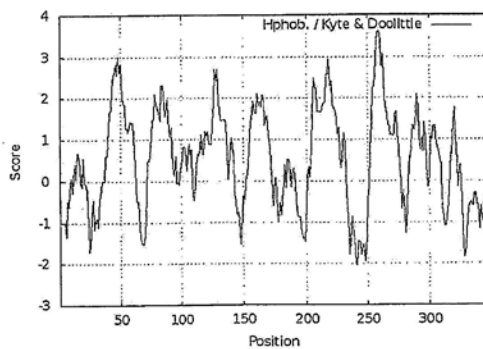
日 期： 0203

節 次： 第 3 節

備 註： 不可使用計算機

※ 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。總分 100 分每題所占分數在題目後括弧內。

1. Answer two organelles unique to plant cells. (4 points)
2. You want to make 100 ml of 0.01M NaOH solution. (1) How many grams of NaOH is required? (Molecular weight of NaOH: 40) (2) What is the hydroxide ion concentration of the solution? (4 points)
3. DNA is normally dissolved and stored in TE buffer (pH8.0). Why is DNA stable in alkaline solution? Explain it, based on the structural difference between DNA and RNA. (4 points)
4. When amino acids are classified into three groups; hydrophobic, hydrophilic, and amphipathic groups, please select the amphipathic amino acids among followings: Ala, Val, Trp, Arg, Lys, Ile. (4 points)
5. Raise three examples of the post-translational modification. (6 points)
6. A chemical reaction in which  $\Delta G$  is positive is best described as \_\_\_\_\_. (4 points)  
A) endergonic  
B) spontaneous  
C) exergonic  
D) enthusiastic
7. What is the difference in chemical structure between saturated fatty acid and unsaturated fatty acid? (6 points)
8. The following figure shows the hydropathy plot for rhodopsin. Explain the structural characters of rhodopsin. (6 points)



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9. What is a signal sequence or signal peptide, and what is the characteristic of amino acids that compose this sequence? (6 points)
10. In SDS-PAGE, we can separate protein molecules based on the difference of their molecular weight. Although each protein has its unique constitute of amino acids, why are proteins separated by their molecular weight? (6 points)
11. What is the cellular advantage of phosphorylating glucose? (10 points)
12. How the TCA cycle is linked to electron transport and oxidative phosphorylation? (10 points)
13. What are the essential features of regulation of gluconeogenesis? (10 points)
14. What are the functions of DNA polymerases? (10 points)
15. How G proteins transduce the signals of GPCRs? (10 points)