

# 國立成功大學

## 113學年度碩士班招生考試試題

編 號：298

系 所：細胞生物與解剖學研究所

科 目：生物化學

日 期：0202

節 次：第 1 節

備 註：不可使用計算機

※ 考生請注意：請於答案卷依序寫上題號並以中文或英文作答，於本試題紙上作答者，不予計分。本試題不可使用計算機或任何電子裝置應考。

※ Write down the question numbers in series on the answer sheet, followed by your answers to each question in either Chinese or English. The use of calculators or electronic devices in this exam is strictly prohibited.

一、名詞解釋 (40 分，每題 4 分。)

以生物化學觀點解釋以下名詞。任選 10 題作答，超過 10 題不計分。

PART ONE: Definition of terminology (40%)

*Directions: Explain the following terms from the aspect of Biochemistry. Among the total of 12 terms below, you are allowed to select 10 and ONLY 10 terms to answer. Any additional selections of terms will not be scored. Each term counts 4 points (4%).*

- Cytochromes
- Ketone body
- Folic acid
- Cori cycle
- SDS-PAGE
- NADPH (nicotinamide adenine dinucleotide phosphate)
- Histone acetylation
- Bohr effect
- Restriction endonucleases
- Epigenetics
- Omega-3 fatty acids
- Biotin

二、問答題 (60 分，每題 15 分。)

詳讀並回答以下問題。若有需要可繪圖或製表輔助闡述論點。

PART TWO: Essay (60%, 15% for each question)

*Directions: Read and answer the following questions in a well-organized way. Draw pictures or tables to illustrate your points, if necessary.*

1. Atherosclerosis (動脈粥狀硬化) is caused by several risk factors including high levels of low-density lipoproteins (LDL) in plasma. What is LDL? Your answers must include its composition, normal function, metabolism, and the role of macrophages in scavenging oxidized LDL. (15%)
2. Signal transmission across the cell membrane results in a cascade of intracellular events by secondary messengers such as calcium ion ( $\text{Ca}^{2+}$ ). How does calcium ion work as a secondary messenger? Your answers must include the processes of the G protein-mediated activation of phospholipase C, hydrolyzation of phosphatidylinositol 4.5-bisphosphate ( $\text{PIP}_2$ ), and phosphorylation of the target enzyme. (15%)
3. Transfer RNA (tRNA) plays an important role in the translation of genetic codes by carrying specific amino acids to the site of protein synthesis. What is tRNA? Your answers must include its structure and how it interacts with both mRNA and rRNA. (15%)
4. Glycogen is the storage form of glucose and is either synthesized or broken down depending on the body's needs. How is the metabolism of glycogen regulated? Your answers must include the roles of insulin and glucagon in modulating glycogenesis and glycogenolysis. (15%)