

國立成功大學
110學年度碩士班招生考試試題

編 號：320

系 所：細胞生物與解剖學研究所

科 目：細胞生物學

日 期：0203

節 次：第 1 節

備 註：不可使用計算機

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第1頁，共1頁

- ※ 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 calculator or electronic devices in this exam is strictly prohibited.

一、名詞解釋 (40 分，每題 4 分。)

以細胞生物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 Cell Biology. 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%).

- Autophagy
- Centriole
- Cytoskeleton
- Extracellular matrix
- Nucleosome
- microRNA (miRNA)
- Plasmid
- Pluripotent stem cell
- Polymerase chain reaction
- Second messenger
- Telomere
- Voltage-gated ion channel

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. Golgi apparatus (Golgi complex) is a membrane-enclosed organelle, which is important for eukaryotic cells to package proteins for secretion. Please describe the function of the Golgi apparatus. Your answers must include its structures as well as how proteins are modified, sorted, and released through exocytosis by the Golgi apparatus. (15%)
2. Mitochondrion is a double membrane-bound organelle, which provides most of the energy needed in eukaryotes. This is fulfilled by producing adenosine triphosphate (ATP) through oxidative phosphorylation in the mitochondrial electron transport chain. What is the electron transport chain in the mitochondrion? Your answers must include how an electrochemical proton gradient is generated and how ATP is synthesized in the mitochondrion. (15%)
3. Apoptosis is a controlled process of programmed cell death, which leads to the elimination of unwanted cells in developing or adult organisms. Please describe how apoptosis is activated. Your answers must include the characteristics of an apoptotic cell as well as the mechanism underlying both the intrinsic and extrinsic apoptotic pathways. (15%)
4. Cell cycle is a series of events through which a mother cell divides into two genetically identical daughter cells. What is a complete cell cycle in eukaryotes? Your answers must include all the phases that occur during the interphase and mitotic phase of a cell cycle and describe step-by-step what happens in each of these phases. (15%)