

※ 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. Please describe molecular mechanisms of how DNA is transcribed into messenger RNA and this messenger RNA is then translated into a protein in eukaryotic cells (20 points).
2. What is “Apoptosis”? Please describe in its activation mechanisms in detail, and give an example to indicate its implication in physiology or disease (20 points).
3. What is “MicroRNA (miRNA)? Please describe its synthesis in the cell and its role in biology (20 points).
4. If you are a scientist, you have identified a novel protein called X, which is possibly involved in regulating expression of Gene B. Please design experiments to determine whether protein X is a transcriptional factor for Gene B expression (20 points).
5. Please describe or define the following terms: (1) Unfold protein response (5 points); (2) Autophagy (5 points); (3) Cell cycle (5 points); (4) Ubiquitin (5 points).