

※ 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. Ultraviolet or chemicals could cause DNA double strand breaks or bulky DNA damages in mammalian cells. Please describe how the mammalian cells can repair such DNA damages. (15 pt) What are the possible fates of mammalian cells experienced DNA damages that no longer could be efficiently repaired? (15 pt)
2. Cell cycle regulation is an important aspect in eukaryotic cells' response to environmental pollutants. Please describe in details the major phases of eukaryotic cell cycle. (15 pt)
3. What is the receptor tyrosine kinase? Please use epidermal growth factor receptor as an example to describe the signaling pathway that leads to the eukaryotic cell division. (20 pt)
4. Genetic information is encoded by stretches of DNA in each cell. However, another layer of information is encoded in epigenetic marks. What is the epigenetic modification? (10 pt) Can this modification be passed from cell to cell or inherited by subsequent generations? Why? (10 pt)
5. Please describe the following terms: (5 pt each)
  - a). Pinocytosis
  - b). Oxidative stress
  - c). Endoplasmic reticulum stress