

系所組別： 細胞生物與解剖學研究所

考試科目： 組織學

考試日期：0220，節次：1

※ 考生請注意：本試題 可 不可 使用計算機**There are six questions. The total score is 100%.**

1. The plasma membrane plays critical roles in maintaining the homeostasis of cells and the organism as a whole. Please summarize the essential features of the plasma membrane in terms of lipid bilayer and transmembrane proteins and how these properties account for its functions. (20%)
2. The cell nucleus is stained by hematoxylin, but the staining intensity varies among cells. For example, the nuclei of neurons are often lightly stained whereas those of small lymphocytes are strongly stained. How does the difference in hematoxylin staining reflect their functional difference? (10%)
3. The adhesion between cells and the extracellular matrix is essential for maintaining the integrity and normal functions of the epithelium. Please summarize how the intracellular cytoskeleton, i.e. actin and intermediate filaments, is linked to the extracellular structure and the major functions they serve. (15%)
4. Hemopoiesis is probably the best known process for cell renewal in the body. Please discuss the following two questions:
  - a. How do common hemopoietic stem cells develop into different types of blood cells? (15%)
  - b. How are these processes regulated in principle? (5%)
5. The epithelial cells of the small intestine and the renal tubules both exhibit abundant microvilli on the apical surface. What are the structural features and functions shared by these epithelia? (15%)
6. The liver is a vital organ in the metabolism of the body. Please discuss the following:
  - a. How do the intracellular organelles reflect the high metabolic activities of liver cells? (10%)
  - b. What is a liver acinus consisted of? How does its cellular arrangement correlated with liver pathology? (10%)