

※ 考生請注意：本試題 可 不可 使用計算機

1. Hematoxylin-and-eosin (H&E) is the most widely used staining method for histological sections. Please answer the following questions.
  - 1) What are the major features you can detect in H&E-stained tissue sections? (10%)
  - 2) Why is this method so popular? (5%)
2. Most cells in the body contain various organelles that are vital to cellular functions. Please take two examples, one with membrane (excluding nucleus) and the other without membrane, and discuss 1) their appearance and distribution under H&E and with other better detection methods, 2) the structure and functions. (20%)
3. Sarcomere is the functional unit of striated muscle. A skeletal muscle fiber contracts after it is stimulated by the nerve terminal of a motor neuron. Please discuss 1) how skeletal muscle fibers are activated by a nerve terminal, 2) how calcium is released and activates myofilaments, and 3) what happens to a sarcomere. (20%)
4. Capillaries are present in most parts of the body. Please discuss the structure-function relationships for different types of capillaries, i.e. continuous, fenestrated and discontinuous (or sinusoidal). Give at least one example each. (15%)
5. The mucosal epithelium of the digestive tract changes as it goes from the esophagus to stomach, small intestine, and large intestine. In addition, glands are found in the mucosa of certain segments. Please compare the epithelium in these four segments of the digestive tract in terms of
  - 1) epithelial type and cell composition. (12%)
  - 2) renewal of the epithelium. (6%)
  - 3) how the epithelial composition and gland distribution reflect the functional features of these segments. (12%)