



**The Hong Kong College of Anaesthesiologists**  
**Intermediate Fellowship Examination**  
**Written Paper in Physiology**  
**14 February 2025 (Friday)**  
**09:00 - 11:00 hours**

**Instructions:**

- There are twelve pre-labelled answer books. Please make sure you answer the questions in the respective answer book.
- Write your candidate number on the cover of each answer book.
- Use ink or ball-point pen.
- Answer ALL questions. They are worth equal marks and you should spend approximately **ten minutes** for each question. For questions with multiple parts, allocation of marks is indicated in the brackets.

- Describe the Ventilation-Perfusion (V/Q) ratio at the apex and base of the upright lung. How does this affect regional gas exchange?**
- Define afterload of the left ventricle. (20%)**  
**Outline and compare the factors that affect afterload of the left and the right ventricles. (80%)**
- On the same axes, draw the oxyhaemoglobin dissociation curve for both foetal and adult haemoglobin. Explain why these curves are different, and the physiological advantages of these differences.**
- Compare and contrast the effects of general and central neuraxial anaesthesia on thermoregulation.**
- List the factors affecting insulin secretion. (30%)**  
**Describe the physiological effects of insulin, including the receptor mechanisms of actions. (70%)**
- What is the ABO blood group system? Explain the ABO compatibility requirements for fresh frozen plasma (FFP).**
- Explain the possible factors, with examples, causing a central venous pressure of 25 mmHg for an intubated patient receiving positive pressure ventilation. Include in the answer, cardiac causes (45%), non-cardiac causes (45%), and other miscellaneous causes (10%).**

- 8. Outline the metabolic adaptations to prolonged fasting.**
  
- 9. Describe the Monroe Kellie doctrine. (40%)**  
**Outline how the rate of cerebro-spinal fluid (CSF) production and absorption may change in response to a slow growing tumor in the brain. (60%)**
  
- 10. Explain how the following situations affect the SpO<sub>2</sub> values detected by the pulse oximeter:**  
**(a) Carbon monoxide poisoning; (b) Poor perfusion.**
  
- 11. Outline the changes in body fluid volume and osmolality with profuse sweating. (20%)**  
**Describe the neuro-endocrine mechanisms activated in response to profuse sweating. (80%)**
  
- 12. Describe and explain the physiological changes in the respiratory system with normal aging.**

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