



**The Hong Kong College of Anaesthesiologists**  
**Intermediate Fellowship Examination**  
**Written Paper in Physiology**  
**1 March 2024 (Friday)**  
**09:00 - 11:00 hours**

**Instructions:**

- a. There are twelve pre-labelled answer books. Please make sure you answer the questions in the respective answer book.
- b. Write your candidate number on the cover of each answer book.
- c. Use ink or ball-point pen.
- d. 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.

1. Discuss the pathogenesis and consequences of a metabolic acidosis caused by hypovolaemic shock.
2. Describe and explain the physiological effects of spinal anaesthesia with a sensory block up to T4 level.
3. Outline the factors affecting coronary blood flow, myocardial oxygen supply and myocardial oxygen demand (60%).  
Describe how oxygen supply can be increased in response to an increase in myocardial oxygen demand (40%).
4. Describe the features of a normal electrocardiogram (ECG) for one cardiac cycle (70%).  
Define QTc, and outline the factors and potential adverse effects associated with prolonged QTc interval (30%).
5. Describe and explain the physiological effects of thyroid hormones.
6. Draw and label a graph of a normal viscoelastic test of clotting function. Outline the information that can be obtained from the graph.
7. Describe the transmission of signals across the neuromuscular junction and the difference among the three types of acetylcholine receptors involved.
8. Explain how intracranial pressure is affected in a patient with acute cerebellar haemorrhage (40%). Explain how intracranial pressure can be controlled by different treatment modalities (60%).

- 9. Describe the changes in glucose metabolism throughout NORMAL pregnancy.**
- 10. Outline the mechanisms by which the kidneys maintain potassium homeostasis.**
- 11. Describe the physiological factors that affect airway resistance.**
- 12. How does general anaesthesia affect respiratory mechanics (50%) and gas exchange (50%) of the lungs?**

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