



The Hong Kong College of Anaesthesiologists

Intermediate Fellowship Examination

Written Paper in Physiology

13 July 2018 (Friday)

09:00 - 11:00 hours

Instructions:

- There are three 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 waveform of the central venous pressure in a healthy adult (60%). Explain the impact of the following conditions on this waveform: (a) complete heart block (b) tricuspid regurgitation (40%).**
- Draw a diagram to demonstrate the oxygen cascade. Explain the physiological factors that influence the decrements in oxygen tension down the cascade.**
- Outline the role of platelets in establishing haemostasis following an injury to the vessel wall.**
- Write brief notes on the stress response to surgery and how it is mediated.**
- Describe the structure and function of the blood brain barrier.**
- Define the functional residual capacity (FRC) and outline the factors that determine it (70%). Briefly explain its clinical significance (30%).**
- Briefly describe the difference between laminar and turbulent flow (70%). List the factors that increase the probability of turbulent flow (30%).**
- Describe (1) the haemodynamic changes (50%) and (2) alterations in regional blood flow (50%) in response to moderate level of exercise.**
- Describe the cardiovascular changes during pregnancy.**
- Describe the acid-base and electrolyte changes associated with long-standing pyloric stenosis.**
- Explain the physical principles of ultrasound imaging (50%). Describe the factors that affect the quality of the image acquired (50%).**
- Explain how hydrogen ions are secreted at the Proximal Convoluted Tubules (PCTs) of the kidney nephron.**