



**The Hong Kong College of Anaesthesiologists**  
**Intermediate Fellowship Examination**  
**Written Paper in Physiology**

**Friday, 11 February 2011, 09:00 AM – 11:00 AM**

The questions carry equal marks. Answer **ALL** of them.

1. Describe the physiological effects of glucocorticoids.
2. Outline the physical principles of pulse oximeter. Draw the haemoglobin extinction curves, and explain the effects of high plasma methaemoglobin concentration on pulse oximeter measurements.
3. Outline the factors affecting the transfer of oxygen from mother to foetus.
4. Draw and write short notes on muscle spindle. Briefly describe the stretch reflex using patellar knee jerk reflex as an example.
5. (i) How is renal blood flow regulated? (5 marks)  
(ii) What are the physiological effects of angiotensin II? (5 marks)
6. Describe the different acids produced during metabolic processes in a healthy individual. Outline the normal adaptive responses to acid-base disturbances.
7. Describe how calcium homeostasis is maintained in a healthy adult. List the changes in calcium metabolism (i) with chronic acidosis; (ii) during hyperventilation and (iii) following parathyroidectomy.
8. Explain the cardiac changes during strenuous exercise in a young healthy adult.
9. Describe the hepatic portal circulation (include the functions and factors affecting blood flow in the hepatic portal circulation). What are the changes in the hepatic portal circulation during acute haemorrhage of 30% of blood volume?
10. Outline the functions of platelet in haemostasis.
11. Describe the hypoxic pulmonary vasoconstriction and explain the underlying mechanism(s). List the factors that increase or decrease hypoxic pulmonary vasoconstriction.
12. Explain why an infant becomes hypoxic more quickly than an adult during an apnoeic episode.

\*\*\*\*\* END OF PAPER \*\*\*\*\*