



The Hong Kong College of Anaesthesiologists

Intermediate Fellowship Examination

Written Paper in Physiology

5 February 2018 (Monday)

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.

1. Explain why a preterm baby born at 30 weeks of gestation is more prone to hypoxaemia compared to an adult.
2. Define and explain the mechanism of cerebral autoregulation. (50%) With the aid of a diagram, outline the factors that may affect cerebral blood flow during anaesthesia. (50%)
3. Describe the mechanisms of baroreceptor reflex in the control of arterial blood pressure. (70%) Outline the factors that may impair the baroreceptor response. (30%)
4. Outline the features of the hepatic circulation, (50%) and describe the hepatic arterial buffer response. (50%)
5. Describe the acute physiological changes that occur with high altitudes.
6. Describe the changes in renal sodium excretion if a patient has persistent diarrhea and vomiting for 3 days.
7. Describe the autonomic innervation of the heart and the effects of autonomic stimulation on cardiac function.
8. Explain how a metabolic acidosis develops in hypovolaemic shock. (50%) Describe the physiological effects of this metabolic acidosis on various body organ systems. (50%)
9. Draw and write short notes on muscle spindle. (50%) Briefly describe the stretch reflex using patellar knee jerk reflex as an example. (50%)
10. Describe the processes, with examples, whereby substances may cross the cell membrane.
11. Outline the physiology of blood groupings that allows O negative packed cells to be safely transfused to most patients.
12. Describe a thermistor. (50%) Describe the features that make it suitable for use in the operating theatre. (50%)

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