The Hong Kong College of Anaesthesiologists

Intermediate Fellowship Examination

Written Paper in Physiology

17 July 2026 (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. **Explain how a decrease in mean systemic filling pressure affects tissue oxygen delivery.**

2. **Explain how an increase in intra-abdominal pressure leads to a reduction in renal perfusion.**

3. **Describe the neural and hormonal factors that affect intestinal motility.**

4. **Describe the factors that lead to an increase in lactate levels in the blood.**

5. **Describe and explain the factors that affect the apnoeic time (time to desaturation) during rapid sequence induction (75%). Explain how this is affected by pregnancy (25%).**

6. **Define cerebral autoregulation. Outline the mechanisms of cerebral autoregulation. (50%) Distinguish between dynamic and static cerebral autoregulation, and list the factors that impair or shift the cerebral autoregulatory curve. (50%)**

7. **Describe the physiological consequences of intravenous administration of 1 L of 5% dextrose to a healthy adult over 1 hour.**

8. **Draw a clearly labelled diagram, illustrate and describe how the core body temperature changes after i) a neuraxial block, ii) general anaesthesia and iii) combined general anaesthesia with a neuraxial block.**

9. **Outline the factors that facilitate oxygen transfer from mother to fetus across the placenta (70%). Explain how fetal oxygen delivery is affected by a reduction in uteroplacental blood flow (30%).**

10. **Describe the structure of the neuromuscular junction (40%) and explain how the arrival of an action potential leads to contraction of the skeletal muscle (60%).**

11. **Describe the changes in structure and functions of aged red cells (50%). Outline the process of breakdown of aged red cells (50%).**

12. **With respect to the coronary circulation,**
    (1) Define the term "coronary perfusion pressure" (20%).
    (2) Draw a clearly labelled diagram, and explain the changes in coronary blood flow during a cardiac cycle, including the difference between the left and right coronary circulations (40%).
    (3) Outline the factors affecting coronary blood flow (40%).

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