



The Hong Kong College of Anaesthesiologists

Intermediate Fellowship Examination

Written Paper in Pharmacology

11 July 2025 (Friday)

14:00 - 16:00 hours

Instructions:

- a. There are twelve pre-labelled answer books. Please make sure you answer the questions in the respective answer books.
- 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.
 - a. **Outline the mechanism leading to systemic toxicity of local anaesthetics and describe the clinical presentations. (75%)**
 - b. **Describe the patient factors that may increase the risk in developing systemic toxicity for amide local anaesthetics. (25%)**
2. **Describe the mechanism of action of phenytoin as an anti-epileptic agent and state the potential side effect(s) when phenytoin is given intravenously. (50%) Explain the underlying reason(s) for plasma phenytoin concentration monitoring. (50%)**
3.
 - a. **List FOUR classes of drugs that promote insulin release from the endocrine pancreas. State one example for each class. Outline their mechanism(s) of action. (80%)**
 - b. **Outline the perioperative management for patients taking these medications regularly. (20%)**
4.
 - a. **Outline the effects and adverse effects of nitrous oxide administered during anaesthesia, that are related to its low blood-gas solubility. (80%)**
 - b. **Describe the environmental impact on the use of nitrous oxide. (20%)**

5.
 - a. Define drug tolerance. (20%)
 - b. Draw a labelled dose-response curve to illustrate the phenomenon of drug tolerance. (20%)
 - c. Describe TWO possible pharmacodynamic mechanisms by which drug tolerance may develop. (60%)
6. Compare and contrast on the use of suxamethonium and rocuronium for providing rapid onset of neuromuscular block to facilitate tracheal intubation.
7.
 - a. Describe the pharmacological properties of ideal agents for providing procedural sedation. (50%)
 - b. Please state FOUR ideal and FOUR non-ideal features of dexmedetomidine as a sedative. (50%)
8. What is randomized controlled trial? Explain the strength(s) and limitation(s) of such study design.
9. Outline the principles of antibiotic prophylaxis for surgical site infections using cefazolin in knee joint replacement surgery as an example.
10. List FOUR classes of antihypertensive drugs that acts on the renin-angiotensin system. Give one example for each class and state the corresponding mechanism of action.
11. Compare and contrast on the pharmacology of intravenous atropine and glycopyrrolate.
12. List SIX classes of drugs, with one example for each class, that can be used to treat intraoperative bronchospasm. Describe the mechanism of action for each class of drugs.