

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

**Part I : 50%**

一、選擇題 (每題 3 分，共 24 分)

1. Which of the followings is the most correct statement regarding the termination of drug action?

- (A) Drug metabolism is always through increased their water solubility;
- (B) Drug metabolism always causes their pharmacologic activity lost;
- (C) Hepatic metabolism and renal excretion represent the two most important pathways of drug metabolisms;
- (D) Excretion of drugs from the body is the only pathway to terminate their action;
- (E) Bloodstream distribution of a drug is required for every drug to exert its action.

2. Aspirin is a weak organic acid with a pKa of 3.5. What percentage of this drug will be in the lipid-soluble form in the duodenum at a pH of 4.5?

- (A) ~1%;
- (B) ~10%;
- (C) ~50%;
- (D) ~90%;
- (E) ~99%

3. In the presence of naloxone, a higher concentration of morphine is required to elicit full pain relief although naloxone itself has no effect on pain relief. According to this, which of the following statement is correct?

- (A) Naloxone is a competitive antagonist;
- (B) Naloxone is a noncompetitive antagonist;
- (C) Naloxone is a physiological antagonist of morphine;
- (D) Morphine is a full agonist while naloxone is a partial agonist;
- (E) Morphine is less potent than is naloxone.

4. Which of the following receptors will elicit the activation of adenylyl cyclase?

- (A) Insulin receptor;
- (B) Estrogen receptor;

- (C) Rhodopsin;
  - (D)  $\beta$ -adrenoreceptor;
  - (E) Tumor necrosis factor-alpha receptor.
5. Which of the followings is the drug target of erlotinib
- (A) microtubule;
  - (B) DNA;
  - (C) epidermal growth factor receptor;
  - (D) Bcr-Abl;
  - (E) thymidylate synthase.
6. A patient was found to have a high resting pulse rate after several cycles of chemotherapy. Further examination reveals cardiomyopathy in this patient. Which of the following is the most likely responsible for the cardiotoxicity in this patient?
- (A) cyclophosphamide;
  - (B) fluorouracil;
  - (C) methotrate;
  - (D) tamoxifen;
  - (E) doxorubicin.
7. Which of the following is the action mechanism of lipid lowering drug gemfibrozil?
- (A) increased expression of LDL receptor;
  - (B) inhibit lipoprotein lipase;
  - (C) increased triglyceride hydrolysis;
  - (D) reduced uptake of dietary cholesterol;
  - (E) increased excretion of bile acid salts.
8. Which of the followings is an important effect of chronic therapy with loop diuretics?
- (A) Elevation of blood pressure;
  - (B) Elevation of pulmonary vascular pressure;
  - (C) Metabolic acidosis;
  - (D) Decreased urinary calcium excretion;
  - (E) Ototoxicity.

**二、簡答題：共 26 分**

1. 試說明在 dose-response curve 上如何區分某一 antagonist 是 competitive antagonist 或是 noncompetitive antagonist。(6%)
2. 試舉 3 例說明抗生素中合併藥物產生 synergistic effect 的作用機制。(6%)
3. 試舉 2 例說明 G protein coupling receptor 的活化機制。(4%)
4. 說明藥物產生 down-regulation 與 desensitization 的機制。(4%)
5. 試說明抗病毒藥物 acyclovir, maraviroc, 與 raltegravir 的作用機制。(6%)

**Part II : 50%**

1. State the drug class, mechanism of action, clinical usage and precautions of the following drugs. (5% each)
  - a. Amoxicillin
  - b. Vildagliptin
  - c. Desflurane
  - d. Methadone
  - e. Aspirin
  - f. Arsphenamine
  - g. Haloperidol
  - h. Furosemide
  - i. Hydrocortisone
  - j. Methylphenidate