

※ 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 (35 分，每題 5 分)**

1. The use of meperidine contaminated with MPTP will result in a Parkinson's disease-like neurotoxicity. Where is the most likely site in the brain that MPTP exerts its toxic effects?
  - (a) Cerebellum
  - (b) Cerebral cortex
  - (c) Hippocampus
  - (d) Substantia nigra
  
2. Which one(s) of the following statements concerning barbiturates is/are correct?
  - (a) Barbiturates promote binding of GABA to GABA receptors in a manner dependent on chloride ion, an effect shared by benzodiazepines.
  - (b) Barbiturates enhanced benzodiazepine binding at the GABA receptor.
  - (c) Both
  - (d) Neither
  
3. Clinical indications for fibrinolytic drugs:
  - (a) some cases of multiple pulmonary emboli
  - (b) some acute myocardial infarctions
  - (c) ascending thrombophlebitis
  - (d) a & b
  - (e) a, b & c
  
4. Which mechanism(s) of anti-seizure medication appear to mediate pharmacological efficacy against the most common manifestations of epilepsy.
  - (a) Enhancement of the inactivated state of voltage-activated sodium channels
  - (b) Augmenting GABA-mediated synaptic inhibition
  - (c) Inhibiting voltage-activated calcium channels associated with T-type calcium currents
  - (d) a & b
  - (e) b & c
  - (f) a & c
  - (g) a, b & c
  
5. Aspirin irreversibly inhibits this enzyme, preventing thromboxane A<sub>2</sub> synthesis. What is this enzyme?
  - (a) streptokinase
  - (b) adenosine deaminase
  - (c) adenylyl cyclase

- (d) cyclooxygenase
- (e) guanylyl cyclase

6. Which of the following statements regarding metal and medical therapy is FALSE?

- (a) There are elevated levels of aluminum in the brain of Alzheimer's patients.
- (b) Lithium is used to treat depression.
- (c) Chronic nephrotoxicity is a common result of excess aluminum exposure.
- (d) Platinum is used as cancer treatment.
- (e) Platinum salts can cause an allergic dermatitis.

7. Which of the following statements is most likely NOT a cause of myocardial reperfusion injury?

- (a) cellular pH fluctuations
- (b) damage to the sarcolemma
- (c) generation of toxic oxygen radicals
- (d)  $Ca^{2+}$  overload
- (e) inhibition of the electron transport chain

## 二、問答題 (15 分)

1. Please describe the difference between Barbiturates and Benzodiazepines. (6%)
2. Please describe major classifications of Antidepressants and state how they work. (9%)

## Part II : 50%

### 一、選擇題：(30 分，每題 3 分)

1. 臨床上使用 Atorvastatin(Lipitor)來降低血脂(lipidemia)，試問其作用機制?
  - (A) 抑制 acetyl-CoA carboxylase；
  - (B) 抑制 acetyl-CoA transferase；
  - (C) 抑制 acetyl-CoA reductase；
  - (D) 抑制 HMG-CoA reductase；
  - (E) 抑制 cholesterol absorption。
2. Viagra (Sildenafil)的分子作用機制為何?
  - (A) 抑制 adenylyl cyclase 而減低 cAMP；
  - (B) 抑制 cGMP phosphodiesterase；
  - (C) 促進一氧化氮(NO)產生；
  - (D) 增加 guanylyl cyclase 活性；
  - (E) 除了 A 以外皆是。

3. 抗生素 penicillin G 因會抑制下列何種酵素而抑制細胞壁的生成？
  - (A) peptidyl transferase;
  - (B) arabinosyl transferase;
  - (C) transpeptidase;
  - (D) transglycosylase;
  - (E) 以上皆非。
  
4. Tamiflu (克流感)可抑制流行性感冒病毒(influenza virus)的何種酵素產生藥理作用？
  - (A) reverse transcriptase;
  - (B) thymidine kinase;
  - (C) protease;
  - (D) neuraminidase;
  - (E) DNA polymerase。
  
5. 秋水仙素 (colchicine)具有治療痛風的作用，下列何者是正確的相關敘述：
  - (A) 透過抑制免疫細胞 T cells 的活性;
  - (B) 透過抑制免疫細胞 neutrophils 的活性;
  - (C) 作用在調控細胞內 cyclooxygenase 的活性;
  - (D) 作用在抑制肌動蛋白(actin)的聚合反應；
  - (E) 除了 C 以外皆是。
  
6. 一些瘧疾病人在服用奎寧(quinin)後產生紅血球溶解(hemolysis)現象，試問這些病人缺乏下列何種酵素？
  - (A) Glucose 6-phosphate dehydrogenase;
  - (B) Hexokinase;
  - (C) Glucose 6-phosphatase;
  - (D) Fructose 1-phosphate kinase;
  - (E) pyruvate kinase。
  
7. 長期或是持續暴露受體(receptor)的 antagonist 會造成下列何種反應？
  - (A) receptor downregulation;
  - (B) tachyphylaxis;
  - (C) supersensitivity;
  - (D) receptor desensitization;
  - (E) A 與 B。

8. 下列何者可加速體內安非他命(amphetamine)的排出？
- (A) 氯化鈉；
  - (B) 碳酸氫鈉；
  - (C) 氯化銨；
  - (D) 胃乳；
  - (E) 以上皆非。
9. 下列何者是正確描述藥物作用受體(receptor)的  $K_d$  值？
- (A) 是藥物與受體之間作用(interaction)的分離( $K_{off}$ ) 與接合( $K_{on}$ )反應速率常數的比值，也就是  $K_{off}$  除以  $K_{on}$ ；
  - (B) 是達到半數的受體與藥物接合的藥物濃度；
  - (C) 是達到 1/2 最大藥效時的藥物濃度；
  - (D) 以上皆是；
  - (E) A 與 B 是正確的。
10. Ipilimumab 是一種治療轉移性黑色素瘤(melanoma)的單株抗體。試問其作用的抗原為下列何者？
- (A) EGF receptor;
  - (B) HER2 receptor;
  - (C) VEGF receptor;
  - (D) CTLA-4;
  - (E) PD-1。

## 二、簡答題：20 分

1. 試舉例說明降血脂藥物的合併療法？(8%)
2. 試說明 physiological antagonist; partial agonist; 與 allosteric modulators (12%)