

國立成功大學

111學年度碩士班招生考試試題

編 號：284

系 所：環境醫學研究所

科 目：毒理學

日 期：0220

節 次：第 2 節

備 註：不可使用計算機

※ 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。

1. Describe the definition of LD_{50} and provide the LD_{50} values for the following toxicants: botulinum toxin, morphine, PCB, table salt, TCDD. Then draw the dose-response curves for two toxicants on a diagram to meet the following conditions: $LD_{50A} > LD_{50B}$ and $LD_{10B} > LD_{10A}$, and comment on which toxicant is considered more toxic. (10%)
2. What is the definition and value of the pK_a of salicylic acid? Draw a diagram and use the diagram to describe how pH values affect the partitioning of salicylic acid across the gastric mucosa and influence the salicylic acid's absorption in gastrointestinal tract. (10%)
3. Tabulate the types of phase I and II reactions, as well as their responsible enzymes, in the biotransformation of the xenobiotics, benzene. Discuss why (1) they result in better efficiency in urinary excretion of xenobiotics and (2) the biotransformation is considered as a balance between bioactivation and detoxification using 1,3-butadiene as an example. (10%)
4. Define the following terms, "ADI", "TDI", and "MRL". Draw a diagram to describe how the ADI, TDI, and MRL can be determined. Use the diagram to explain how an MRL value for ractopamine is set to be 0.01 ppm and why this value is considered safe for consumers. (10%)
5. 人類的癌症有 35%來自飲食，就您所知，請細數飲食中有那些因子會致癌？那些會抗癌？(10%)
6. 安姆氏測試法 (Ames test) 被廣泛的應用在環境毒物是否俱有基因毒性的篩選。請解釋何謂基因毒性 (Genotoxicity)？並說明安姆氏測試法的測試原理。(10%)
7. 環境污染物若被發現俱有致癌特性往往會受到特別關注。請說明化學致癌物質誘發腫瘤產生的步驟及可能的機制 (10%)
8. 自十七、八世紀以來，粒狀污染物(particles)一直威脅著人類健康。請舉出兩種造成許多民眾罹患肺部疾病的重要粒狀污染物，並分別述明其毒性危害機制。(30%)