

國立成功大學

112學年度碩士班招生考試試題

編 號：281

系 所：環境醫學研究所

科 目：毒理學

日 期：0207

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. Use the fact, pK_a (salicylic acid) = 2.97, 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%)
2. Describe and discuss their advantages vs. disadvantages of the two major models for estimating the risk of toxicant exposure at low doses below NOAEL. Which one is often used for carcinogenic toxicants? Why? (10%)
3. An abandoned pentachlorobenzene (PCP) manufacturing plant is highly contaminated with residual PCP in the An-Shun area of Tainan. Assuming you are invited by the Tainan city government to provide your expert opinion on setting an environmental exposure guideline for fish ingestion of PCP, please (1) draw a flowchart to describe how the PCP concentration limit of fish being sold in the market can be developed; and (2) use the following information to calculate the value of PCP concentration limit of fish. (i) Average body weight of the city resident: 60 kg; (ii) 5th, 50th, and 95th, percentile fish consumption rate: 5.3, 20.1, and 63 g/day for the residents of Tainan; (iii) LD₅₀ for PCP in rats: 150 mg/kg/day; (iv) NOAEL for PCP in rats: 30 mg/kg/day; (v) Tolerable Daily Intake (TDI) for PCP: 0.03 mg/kg/day; (vi) Minimal risk level (MRL) from Agency for Toxic Substances and Disease Registry (ATSDR) for PCP in human: 0.005 (acute) & 0.001 (chronic) mg/kg/day; (vii) Average weight of the fish in the market: 600 g; (viii) Uncertainty factor: 1000; (ix) The mayor promises the safety guideline will protect top 5 percent of heavy fish consumers. (15%)
4. Cigarette smoking may contribute to the development of lung obstructive disease and lung cancer, and the increase of lung infections. Please describe the humoral-mediate and cellular-mediated immune responses incurred following cigarette smoking. (30%)
5. 簡單的說明俱有荷爾蒙類似作用的環境毒物如何透過訊息傳遞方式造成生理生化功能的改變？(10%)
6. 試說明Ames及hprt mammalia mutation assay的作用原理。(10%)
7. 自由基已經是目前科學界熱衷的研究主題之一，請說明自由基的定義及列舉五種自由基的種類(reactive oxygen species, ROS)。(15%)