

系所組別：環境醫學研究所乙組

考試科目：化學儀器分析

考試日期：0307·節次：3

※ 考生請注意：本試題 可 不可 使用計算機

1. Describe the working principles, applications, and/or definitions in chemical instrumentation of the following techniques, devices, or terminologies. If the terms are acronyms, give their full names (in English). (25%)
 - (1) APPI
 - (2) FID
 - (3) Reflectron
 - (4) FT-ICR
 - (5) Standard addition
2. Give the definition of detection limit. Then propose a standard operation procedure on how the detection limit for measuring a drug metabolite in human plasma using an LC-MS/MS (triple-stage-quadrupole) instrument can be assessed. (15%)
3. Draw a diagram showing components of an HPLC system and describe the functions of these components. (15%)
4. Construct a hypothetical van Deemter plot for a packed liquid chromatographic column. Explain the meanings of A, B, and C terms. (15%)
5. Describe the working principles and applications of MALDI and ESI. Make a comparison between these two ionization techniques. (15%)
6. Answer the following questions related to "signal resolution". (15%)
 - (1) How is chromatographic resolution calculated?
 - (2) How is mass spectrometric resolution calculated?
 - (3) Discuss why different procedures are used to calculate chromatographic and mass spectrometric resolutions. Also list the advantages and disadvantages of these two procedures.