國立臺灣大學 114 學年度碩士班招生考試試題

1. 請閱讀以下短文，並以英文簡答 (40%)：

Scientific reproducibility, a cornerstone of research validation, has become a growing concern in the academic community. A comprehensive study surveying approximately 1,500 scientists revealed a widespread challenge: more than 70% of researchers failed to reproduce experiments conducted by their peers, while over 50% encountered difficulties replicating their own previous work. This apparent crisis in methodological consistency has sparked debate within the scientific community. Interestingly, despite these reproducibility challenges, most researchers maintained confidence in published literature, with 73% believing that at least half of the papers in their field could be trusted. Only 31% of scientists considered failed replication as an indicator of invalid results.

The study identified several key factors contributing to reproducibility problems. The most significant issues were publication bias and selective reporting, where scientists tend to report only successful results. Other factors included insufficient testing of experiments, inadequate peer review, and technical difficulties. Communication was also a major barrier – less than 20% of researchers had been contacted by others about failures to reproduce their work.

Different scientific fields showed varying levels of commitment to addressing these challenges. Medical research institutions led the way, with 41% of laboratories implementing specific measures to improve experimental reproducibility. In contrast, only 24% of laboratories in physics and engineering fields adopted such measures. Most scientific institutions suggested specific improvements, including better experiment design, enhanced data analysis, improved research training, and standardized testing methods. While implementing these improvements could increase research time by 30%, 80% of scientists believed such changes were necessary.

ATTN: Use specific examples and statistics from the passage to support your answers.

1) What is "reproducibility" and how many scientists in the survey had problems with it? Support your answer with numbers from the passage. (8%)
2) The passage reveals a contradiction in scientists' attitudes regarding the notion of reproducibility. Explain this contradiction using statistics from the passage. (8%)
3) According to the passage, what are the barriers to improving scientific reproducibility? Identify at least two barriers and explain their potential impact on scientific research. (8%)
4) According to the passage, what differences exist between medical research and physics/engineering fields in addressing reproducibility? Include specific percentages in your answer. (8%)
5) What specific improvements does the passage suggest for enhancing reproducibility? (8%)

2. 請將本段落翻譯為英文(30%)：

電子郵件是圖書館執行館務營運與服務讀者的重要資通訊工具，但同時也是資安威脅的主要來源。攻擊者可能會偽造資料庫廠商的系統更新通知、期刊出版社的電子期刊訂閱確認信，或是文獻傳遞申請等釣魚郵件。這些經過精心設計的社交工程攻擊，往往誘使使用者點選惡意連結，導致其在偽造的身份驗證頁面上輸入帳號與密碼。一旦擁有管理者權限的帳號遭到盜用，攻擊者不僅能夠存取圖書館資訊系統的後端資料庫，更可能藉由資料庫管理權限，竊取讀者個資與電子資源採購合約等重要資訊。

3. 請將本段落翻譯為中文 (30%)：

The evolution of information discovery in academic libraries has been transformed by artificial intelligence technologies. Conventional search methods, such as keyword searches and database queries, often leave researchers overwhelmed by the vast amount of available information, making it difficult to locate relevant resources efficiently. AI-powered solutions now offer enhanced search capabilities, including intelligent metadata extraction, automated literature review, and personalized content recommendations. These tools not only help researchers navigate through extensive databases more effectively but also assist librarians in improving content organization and accessibility. While AI brings significant advantages to information discovery, libraries must carefully evaluate these tools to ensure they maintain the quality and reliability of academic resources. The challenge lies in balancing advanced technology with core library principles of providing authoritative and well-curated information to support scholarly research.

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