

國立中正大學九十九學年度博士班招生考試試題

系所別 (組別): 心理學系

科目: 心理計量學

1. Compared to classical test theory, what are the advantages and disadvantages of item response theory (IRT)? (10 分)
2. From a Rasch perspective, what are the advantages of using the family of Rasch models over multi-parameter models? (10 分)
3. Please explain the connections among the Rasch model, the rating scale model, and the partial credit model. (10 分)
4. What is differential item functioning (DIF)? There are two approaches to test for DIF: nonparametric and parametric approaches. Pick one of the approaches and explain the advantages and disadvantages for it. Considering the approach you picked, what methods would you suggest to use for a DIF analysis and why? (10 分)
5. 何謂效度縮減 (validity shrinkage), 試說明之。(10 分)
6. 試說明因素分析與試題反應理論間的關係。(10 分)
7. 已知變數 X 為一白努利試驗 (Bernoulli trial), 機率函數為 $f(X = x) = p^x(1-p)^{1-x}$ ($x = 0, 1$)。假設由母體中獨立地隨機抽樣 n 個 X_i , 請求取 p 的最大概似估計量 \hat{p} 。(20 分)
8. 欲檢定一銅板是否公正, 某生做了 3 次實驗, 若 3 次都出現正面或 3 次都出現反面, 則推論該銅板非公正銅板。請求出此檢定的型 I 錯誤 (α)。此外, 如果出現正面的機率是 0.4, 請求出此檢定的檢定力 (Power)。(10 分)
9. 假設迴歸模式為 $Y_i = 2 + 5X_i + \varepsilon_i$, where ε_i are independent $N(0, 1)$, $i = 1, \dots, n$. 請求出下列值 $E(Y_1)$ 、 $E(Y_2)$ 、 $Var(Y_1)$ 、 $Var(Y_2)$ 、 $Cov(Y_1, Y_2)$ 。(10 分)