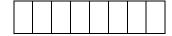
國立臺北科技大學

一〇二學年第二學期電機系博士班資格考試

圖形識別 試題

第一頁 共一頁



- 本試題共【5】題,配分共100分。
 請按順序標明題號作答,不必抄題。
- 3. 全部答案均須答在試卷答案欄內,否則不予計分。
- 考試時間:二小時。
- 1. (25%) Let $f(net) = a \tanh(b \ net) = a \left[\frac{1 e^{-b \ net}}{1 + e^{-b \ net}} \right] = \frac{2a}{1 + e^{-b \ net}} a$.
 - (a) Show that its derivative f'(net) can be written simply in terms of f(net) itself.
 - (b) What are f(net), f'(net), f''(net) at $net = -\infty$, 0, $+\infty$
- 2. (25%) Many pattern recognition systems can be partitioned into sensing, segmentation, feature components: classification, post-processing. Please address these components, respectively.
- 3. (20%) Please propose some practical techniques for **improving backpropagation** of multilayer neural networks.
- 4. (15%) Please explain k-means clustering.
- 5. (15%) Please explain Principal Component Analysis (PCA).