

# 國立臺北科技大學 104 學年第二學期

## 電機系博士班資格考試試題範本說明

- 一. 本系博士班資格考試試題為 A4 格式之版面。
- 二. 提供之試題範本自第 1 頁起提供 A4 格式之版面共 4 頁，若有不足請自行加頁。
- 三. 本範本以 Office 之 Word 文書應用軟體製作，命題委員至少須輸入之資料共四項，各項簡要說明如下：(前三項請依範本上之原字型與字型大小輸入，**前二項已代為執行合併列印套稿，請確認組別名稱與考試科目**。謝謝您！)

(一) **【考試科目名稱】** ⇒ [依所附檔案內**考試科目名稱**完整輸入取代]

(二) ⇒ [請依試題**題數**輸入取代並增加**必要之配分**與**各項特殊規定**]

### 注意事項：

1. 本試題共 **【10】** 題，配分共 100 分。
2. 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。
4. 考試時間：二小時。

(三)

**試題本文** ⇒ [請輸入**題號**與**試題內容**並完成排版與列印]

### 範本版面說明

試題本文之外方格線，係以單格表格並以隱藏格線方式設計，請在格線內命題，不要超出格線外；若有圖片，亦請於列印後黏貼於規劃版面內。謝謝！

- 四. 命題版面達 A4 共 2 頁(含)以上時，請修改範本第 1 頁之 **第一頁 共一頁** 為 **第一頁 共二頁**；若頁數更多，請類推修改增加之。
- 五. 本範本檔案及考試科目名稱檔案，將由本系以隨身碟提供命題委員，請命題委員在規劃版面內命題，**並以 A4 紙張列印出試題繳交，隨身碟亦請交給本系**。本系將直接列印後隨即製版，不再作其他處理，若有圖片請自行黏貼於妥當之版面位置。

# 國立臺北科技大學

## 104 學年第二學期電機系博士班資格考試

### 計算機概論(大學部)試題

第一頁 共二頁

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#### 注意事項：

1. 本試題共【10】題，配分共 100 分。
2. 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。
4. 考試時間：二小時。

1. Can **overflow** ever occur when values are added in two's complement notation with one value positive and the other negative? Explain your answer. (10%)
2. MP3 takes advantage of the properties of the human ear, temporal masking and frequency masking. Explain what are **temporal masking** and **frequency masking**, respectively. (10%)
3. What is a **virtual memory**? (10%)
4. Suppose you want to interchange the values stored in memory cells 2 and 3. What is wrong with the following sequence of steps:  
Step1: Move the contents of cell 2 to cell 3.  
Step2: Move the contents of cell 3 to cell 2.  
Design a sequence of steps that correctly **interchanges the contents of these cells**. (10%)

5. The **Euclidean algorithm** finds the greatest common divisor of two positive integers  $X$  and  $Y$  by the following process. (Assuming that  $X$  is larger than  $Y$ .) As long as the value of neither  $X$  nor  $Y$  is zero, continue dividing the larger of the values by the smaller and assigning  $X$  and  $Y$  the values of the divisor and remainder, respectively. (The final value of  $X$  is the greatest common divisor.) Express this algorithm in C language. (10%)
6. What advantage does **public-key encryption** have over more traditional encryption techniques? (10%)
7. What is a **router**? (10%)
8. When software is divided into manageable units, generally called modules, the design of modules should consider coupling, cohesion, and information hiding. Define **coupling**, **cohesion**, and **information hiding**. (10%)
9. Give a formula for finding the entry in the  $i_{\text{th}}$  row and  $j_{\text{th}}$  column of a two-dimensional array if it is stored in **column-major order** rather than row-major order and  $R$  is the number of rows in the matrix. (10%)
10. Describe how a **stack** can be implemented in a high level language in terms of one-dimensional array and how the **stack pointer** is implemented. (10%)