國立中央大學九十學年度碩士班研究生入學試題卷

所別：資訊工程學系　不分組　科目：計算機概論　共 1 頁 第 1 頁

(作答一律使用中文,答題時必須在最左側標明答哪一題的哪一部分,作答時以簡短爲原則,答非所問酌予扣分)

1. (5%)Name the two essential parts of the CPU, and tell what each part does.
2. (5%)How does cache memory differ from RAM memory? (5%)How does the CPU use cache memory to speed processing?
3. (5%)List five factors that affect a computer's processing speed.
4. (4%)What is the difference between a CISC processor and a RISC processor?
5. (6%)What are the advantages and disadvantages of using a Token Ring network?
6. (10%) 多工環境 (multitasking) 有哪兩種實現方式？其原理何在？目前的作業系統又各自支援哪一種多工環境？
7. (8%) 請將以下數字轉換成十進制數字。

   $1A03_{16}$ = ?, 1603_8 = ?, 1101 (正整數) = ? 1101 (一的補數) = ?, 1101 (二的補數) = ?
8. (2%) 請將十進制 19.375 表示成實數 (格式： sign：一位元，Exp：四位元，mantissa：七位元)。

9 Use C++ or JAVA to write the interface part of the **stack** data structure, (10%) Use an example to explain how the stack data structure is used to process the argument passing and return address handling in subroutine/function call.(5%) (data structure)

10 Use program statement to explain the following terms. These terms are all used in Object oriented programming language (you **must** use program statements to explain. You can not get scores otherwise) (15%)
   (a) abstract class (2%), concrete class(2%), abstract/pure virtual function(2%)
   (b) Polymorphism (5%)
   (c) Describe the benefit of polymorphism (4%)
   (introduction to computer science/ programming)

11 Supposed you are asked to develop an application on PDA or wireless handset (WAP). You do not quite understand how to do it. Now, you have a computer that is connected to internet. List the most important steps you will do to make the task done. What information is most important that you need to find? (5%)
   (introduction to computer science/ programming)

12. (15%) (a) What is a **heap tree**? When will you like to use the heap tree structure? Please illustrate the creation of a heap of size 10 from the original file (36, 5, 77, 1, 61, 11, 9, 15, 49, 19) (5%)
   (b) Write a program (in C++/JAVA) to create initial heap. Assume array is used as the data structure to store the data. (5%)
   (c) Please illustrate the adjustment of the heap created in (a) until all data are sorted.(5%)
   (data structure)