國立暨南國際大學 100 學年度轉學生入學考試試題　第2節

科目：資料結構與演算法　適用：資工系三

編號：821

考生注意：
1.依次序作答，只要標明題號，不必抄題。
2.答案必須寫在答案卷上，否則不予計分。
3.限用藍、黑色筆作答；試題須隨卷繳回。

本 試 題
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第 ／ 頁

1. In the Knapsack problem, if the size of each object is arbitrary real number, does dynamic programming method still work? Explain your opinion in detail. (10%)

2. The sequence $F(n)$ of Fibonacci numbers is defined by the recurrence relation

   $$F(n) = F(n-1)+F(n-2),$$

   with seed values

   $$F(0) = 1, \text{ and } F(1)=1.$$

   (a) If using the recursion method to calculate the value of $F(16)$, how many times of additive operations will be performed? Explain your answer briefly. (15%)

   (b) If using the dynamic programming method to calculate the value of $F(16)$, how many times of additive operations will be performed? Explain your answer briefly. (15%)

3. Explain the concepts of the following algorithms,

   (a) Kruskal's method (10%)

   (b) Prim's method (10%)

   (c) Give a comparison between the Kruskal's method and the Prim's method. (20%)

4. Answer the following questions with explanation,

   (a) Give a proper data structure to implement a skewed binary tree. (10%)

   (b) Give a proper data structure to implement a complete binary tree. (10%)