

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. Definition of a Fibonacci series is as follows:

$$F_1=1, F_2=1, F_3=2, F_4=3, \dots, F_n=F_{n-1}+F_{n-2}$$

Write a **recursive** program to calculate the n^{th} element of the Fibonacci series. You may use either C, C++ or pseudocode. (20%)

2. You are assigned to lead a team to develop a software package for a certain biomedical application. The first thing to do is to decide which programming language should be used for such development. What factors should be taken into consideration in order to develop this software efficiently and achieve good software performance? Name at least three factors and explain their importance. (20%)

3. Assume that you work for a computer company. Recently, the company is considering to bid (競標) for setting up the computer system, including servers and workstations, of a new mid-size hospital with around 200 beds. What factors should be taken into consideration in order to determine the total budget (預算) of building up the whole computer system of this new hospital? Name at least three factors and explain their importance. (20%)

4. When developing software packages, often there is a significant trade-off between speed and memory usage. Use an example to explain why such a trade-off exists. (20%)

5. List three advantages of objective-oriented languages (such as Java and C++) over procedural languages (such as C). Explain the importance of those advantages for software development and maintenance. (20%)