

※ 注意：請於答案卷上依序作答，並應註明作答之大題及其題號。

Part I: Choose a proper glossary entry (20%)

- ( ) Expert system
- ( ) Class diagram
- ( ) Generic algorithm
- ( ) OpenGL

- A: A computer-based system designed to help a person to make decision in a specific domain.
- B: A diagram that shows the classes of a system and the association between them.
- C: A diagram that shows the sequential logic between classes.
- D: A computer program capable of performing at the level of a human expert in a narrow domain.
- E: A vendor-neutral, multi-platform standard for high performance 2D/3D graphics on devices ranging from mobile phones to PCs to supercomputers.
- F: A diagram that depicts the logic flow of a class method.
- G: A computer program used to for simulating evolution on a computer.
- H: A diagram that depicts top-down structure of a class.
- I: Application programming interfaces

Part II: Computer Programming (20%): you should write your program using one of the following programming languages: Fortran, C, C++ or Java.

Write a program to perform the following matrix multiplication.

$$[C]_{3 \times 5} = [A]_{3 \times 4} [B]_{4 \times 5}$$

Part III: 問答題 (60%)

1. (20%) 一項新資訊技術的普及通常都會對土木領域在解決工程問題帶來一定的衝擊。試以 wireless sensor network 為例，闡述此技術對土木工程建物（如橋樑等）生命週期管理可能帶來的衝擊。
2. (20%) Describe one of the data structures listed below in details. Your description should at least include the intent of the data structure, the problems it tries to solve and its known usages in practice. (Your choice of data structures: list, set, map and binary tree)
3. (20%) Describe one of the numerical methods listed below in details. Your description should at least include the intent of the numerical method, the problems it tries to solve and its known usages in practice. (Your choice of numerical methods: finite element method, finite difference method, and neural network method)

試題隨卷繳回