2009 Paper 1 Question 7

Software Design

(*a*) Describe the difference between a class and an instance. Show typical examples of each as they would be represented in UML diagrams and in source code.

[4 marks]

(*b*) Explain the relationship between information hiding and loose coupling. Your explanation should mention class interfaces, visibility modifiers, and accessor methods. [6 marks]

(*c*) Consider the design of a future student records database system for Cambridge, and in particular, a module for examination registration and grading. Use this example to illustrate some of the separate phases of a software design project, by showing outline examples of:

(*i*) a usage scenario,

(*ii*) a class diagram related to that scenario,

(*iii*) a collaboration diagram related to the scenario, and

(*iv*) the public interfaces and fields for two of the classes in these diagrams.

You should not attempt to describe a complete design, but simply include enough detail to show the differences and relationships between these kinds of design model.

[10 marks]