

2007 Paper 5 Question 4

Concurrent Systems and Applications

- (a) A software engineer is developing computer-aided design software for an architect who works with designs for three different types of building: Contemporary, Victorian, and Roman. When laying out buildings, the architect places windows, doorways, walls and roofs in the appropriate style for the building on which she is working. Explain, including all the Java interfaces and code fragments, how the software can use the Abstract Factory design pattern to construct and maintain its internal data structures representing a building. [6 marks]
- (b) In terms of software testing, what is *equivalence partitioning*, how can it be done, and how can the partitioned sets be used to select test patterns? [6 marks]
- (c) What are *decision coverage* and *condition coverage*? [2 marks]
- (d) Describe Java's Remote Method Invocation (RMI) system, including the means by which objects and servers are named, how clients perform binding, and the purpose of the RMI CodeBase. [6 marks]