

**UNIVERSITY OF LONDON**

**GOLDSMITHS COLLEGE**

**B. Sc. Examination 2004**

**COMPUTING AND INFORMATION SYSTEMS**

**IS52018A (CIS224)**

**Software Projects: Software Engineering and Research  
Methods**

**Duration: 1 1/2 hours**

**Date and time:**

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*Full marks will be awarded for complete answers to a total of two questions. Each question carries 25 marks. The marks for each part of a question are indicated at the end of the part in [.] brackets.*

*There are 50 marks available on this paper.*

*Electronic calculators must not be programmed prior to the examination. Calculators which display graphics, text or algebraic equations are not allowed.*

### **Question 1**

(a) In the early 1990's the International Standards Organisation (ISO) produced a standard model for assessing the quality of good software *systems*. The model consists of six major characteristics. Briefly explain the properties of each of these characteristics.

[18 marks]

(b) What is the purpose of a modelling language?

[7 marks]

## Question 2

- (a) What is a test plan? [4 marks]
- (b) Describe the purpose of a test specification. [4 marks]
- (c) Explain the term 'test oracle' and comment on why it is used. [3 marks]
- (d) What is a test case, and why is it important to select representative test cases? [3 marks]
- (e) How does white box testing differ from black box testing? [3 marks]
- (f) What are possible test cases for the following method, and what does the test oracle predict for each case? [8 marks]

```
public void printStars (int height){  
    if ( height > 10 ) height = 10;  
    for ( int row = 1; row <= height; row++ ){  
        for ( int col = 1; col <= row; col++ ){  
            System.out.print("*");  
        }  
        System.out.println();  
    }  
}
```

### Question 3

(a) It is believed that modularisation can lead to good quality software. Good module design requires that modules are (i) cohesive, (ii) loosely coupled, (iii) encapsulated and (iv) reusable. Write a paragraph on each of these four attributes. If necessary, you may illustrate your answer by explaining how these attributes might apply to a particular class, for example a **book** class for a library monitoring system.

[16 marks]

(b) Provide some guidelines for good class design.

[9 marks]