THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Diploma

SYSTEMS ANALYSIS

15th October 2003, 2.30 p.m.-4.30 p.m.

QUESTION 1 is mandatory and receives 50% of the total marks available for this paper.
Candidates may select TWO of the remaining FOUR questions.
Time: TWO hours

*The marks given in brackets are **indicative** of the weight given to each part of the question.*

1. A Student Accommodation Service helps university students to find properties to rent in the city in which they are studying. An information system is required to help the Service maintain lists of landlords, their properties and of students seeking accommodation.

All of the properties are owned by private landlords; each property is owned by one landlord, though some landlords own several properties. The name, address and telephone number of landlords are kept. When new properties are added to the system they are allocated a unique identifying number and details are taken of the address, type of property (for example, flat, terraced house, detached house), the maximum number of tenants it is suitable for and the amount of the rent. Landlords are charged a fee for each property that is added to the system.

Students seeking accommodation have to register with the Service providing their name, current address, telephone number, their date of birth and gender. Once registered, a student can be provided with a list of available properties. If a student makes a request to view a property the Service arranges a viewing with the landlord. Details are kept of each viewing that is arranged including the date on which it took place and which student or students were involved (friends often seek accommodation together).

Landlords notify the Service when a property is no longer available for rent and when a property is once again available. In both cases the Service updates the property file so that students seeking accommodation can be given an accurate list.

a) Draw a Top Level Current Logical Data Flow Diagram for the above scenario. **(20 marks)**

b) Produce an Entity Relationship Diagram (Logical Data Structure) and a set of normalised tables for the above scenario. You **DO NOT** have to show evidence of the normalisation process. Your diagram should include the entity type 'Student'. **(20 marks)**

c) If an object-oriented model were to be prepared for the above scenario a Class Diagram would be drawn.

i) Show what the class 'Student' would look like using UML notation. **(6 marks)**
ii) Explain the difference between the representation of 'Student' as a class and as an entity (as in your solution to question 1b). **(4 marks)**

2. Compare and contrast the Structured Systems Analysis and Design Method (SSADM) and the Object Oriented approach to modelling data and processing requirements. **(25 marks)**

3. *a)* Explain briefly what is meant by a 'hard' and by a 'soft' approach to systems development and identify ONE methodology of EACH type of approach. **(6 marks)**

b) Discuss the disadvantages of both 'hard' and 'soft' methodologies and how these disadvantages may be overcome. **(19 marks)**

4. *a)* Identify the key document that you would expect to be the output of the systems analysis phase of a systems development project and describe what you would expect it to contain. **(11 marks)**

b) Explain the contribution that a Computer Assisted Software Engineering (CASE) tool can make in the preparation of systems analysis documentation. **(14 marks)**

5. Explain, with an example of each, FIVE of the following terms as used in systems analysis:

a) Systems and subsystems **(5 marks)**
b) Socio-technical analysis **(5 marks)**
c) Spiral life cycle **(5 marks)**
d) Storyboarding **(5 marks)**
e) Physical and logical models **(5 marks)**
f) Functional and non-functional requirements **(5 marks)**
g) <<includes>> use case association **(5 marks)**