

# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATION Diploma

### SYSTEMS ANALYSIS

14<sup>th</sup> October 2004, 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.*

#### **'Hey Presto - English Language School'**

1. 'Hey Presto' is a well established and growing English language school. The Principal has identified Information Systems as a priority for future developments. Following an initial systems analysis exercise undertaken by your colleagues, you have been asked to model the processing and data for the current 'student grades' system. Your colleagues have provided you with the following information regarding the 'student grades' system:
- We record grades for two types of students; students that are sponsored by their employers and overseas students that are here on a study visa.
  - Student coursework and examination marks are passed to the Office Manager by module tutors.
  - Before marks can be recorded we access the student record to check that the grades submitted are for a registered student and that the grades are for a module on one of our courses. A course is made up of between 3 and 6 modules.
  - If marks are provided for a non-registered student, or a module that is not part of one of our courses, we record the details of the invalid mark separately and pass the details to the Office Manager. We do not process invalid marks until the problem has been investigated and rectified by the Office Manager.
  - Once both coursework and examination marks for modules have been recorded, they are printed for checking by the module tutor.
  - Once module marks have been checked and approved by the module tutor, they are reprinted and presented to the Board of Examiners for its consideration.
  - We send the students their approved results after each meeting of the Board of Examiners.
  - We also send a copy of the student results to the employer of sponsored students.
  - For overseas students, we have to check that their visa is not out-of-date before releasing their results to them.
- a) Draw a Top Level (i.e. the level below the Context Diagram) Current Logical Data Flow Diagram for the above scenario. **(15 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. **(15 marks)**
- c) It has been decided that the system will be developed as an Object Oriented system. Sketch an initial Analysis Class Model that shows the processing and data required to support the 'student grades' system. Include any inheritance structures and aggregations that you identify. **(20 marks)**

2. The models requested in Question 1a) and 1b) represent the process and data views respectively of the system under development.
- a) Identify a model used in SSADM to represent a third view of the system and illustrate the notation used by means of a general diagram. **(7 marks)**
  - b) Explain how this third view of the system may be cross-checked against the process and data views of the system. **(4 marks)**
  - c) Compare the approach taken to modelling data, process and time by an Object-Oriented methodology such as the Unified Process with the 'three views' approach of SSADM. **(14 marks)**
3. a) Define what is meant by a 'prototype' in the context of information systems development and explain how prototyping might be used during the Systems Analysis stage of a project. **(13 marks)**
- b) Identify any disadvantages of using a prototyping approach to systems analysis. **(12 marks)**
4. a) Identify the key stages of the traditional systems development 'waterfall' lifecycle and explain why, in practice, these stages are rarely followed in sequence. **(9 marks)**
- b) Explain what is meant by the term, *Rapid Application Development (RAD)* and discuss the advantages and disadvantages of adopting a RAD approach to systems development. **(16 marks)**
5. Explain FIVE of the following terms in the context of the Systems Analysis phase of a project:
- a) Rich Picture **(5 marks)**
  - b) Feasibility Study **(5 marks)**
  - c) Requirements Specification **(5 marks)**
  - d) Use Case **(5 marks)**
  - e) Computer Aided Systems (or Software) Engineering (CASE) tool **(5 marks)**
  - f) 'Soft' methodology **(5 marks)**
  - g) Structured Walkthrough **(5 marks)**
- (5 x 5 marks)**