

THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATIONS BCS Level 5 Diploma in IT

SYSTEMS ANALYSIS

19th October 2006, 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.*

Calculators are NOT ALLOWED in this examination.
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1. The Chan family are the proud new owners of the Paradise Beach Guest House with its 10 en-suite rooms, bar and restaurant. They have asked you to develop a system that will manage the room bookings processes, keep details of additional services that guests purchase during their stay and produce the final bill for a stay. The Chan's describe the processing involved as follows:

- A booking or visit starts with a room request coming in from a potential guest. We take details of the reservation request and search for availability by looking in the desk-diary to see which rooms are available for the required dates. We have 2 single, 6 double and 2 family rooms that can accommodate up to 5 persons in each.
- If the required rooms are available we create a record of the reservation and include details of the room allocated to the reservation, start and end dates and the number of guests staying in the room. At this stage we also check to see if the potential guest has stayed with us before or not. If they have, we find their details, check they are still accurate and then add their details to the reservation. If they haven't stayed with us before, we take the name of the guest making the reservation and their contact details and add these to our records.
- If a guest wants to reserve more than one room we create a separate reservation record for each room reserved.
- When guests arrive at the start of their stay, we find their reservation and personal details, checking that their personal details are still correct and updating them as necessary. We then book them in for their stay, we call this an 'occupancy'. Local laws require that we record the names and age of all guests and which room they are staying in.
- We provide a restaurant, cinema and theatre booking service for our guests. This process involves little more than a telephone call to the organization and a verbal agreement being reached between the Guest House and the organization.
- During their stay at the Guest House guests may purchase or hire additional services and products from us, such as newspapers, cycles, maps, food and drinks. We need to record all of these so that we can charge for them at the end of the stay.
- At the end of their stay guests request their final bill. We would like the system to calculate and produce this final bill. We then give it to the guest so that payment can be made. We keep a record of how much each stay in a particular room was billed for so that we can calculate income per room over a given period of time.

(Question 1 questions are on the next page).

- 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. **DO NOT** show evidence of the normalisation process. (20 marks)
- c) Explain, **USING AN EXAMPLE** from the Data Flow Diagram you produced in response to Question 1 a), the meaning of the term ‘a balanced set of data flow diagrams’. (10 marks)
2. a) Identify **FIVE** fact finding techniques that may be used to gather systems requirements. (5 marks)
- b) For the system outlined in Question 1, evaluate the suitability of **EACH** of the techniques identified in your answer to Question 2 a) for gathering the systems requirements. (20 marks)
3. a) Identify the advantages of using prototyping during the **systems analysis** phase of a project. (13 marks)
- b) Explain the issues that a project manager needs to address if prototyping is used during the systems analysis phase of a project. (12 marks)
4. a) Explain how functional requirements are modelled and documented in the systems analysis phase of a project using an Object-Oriented approach to systems development. Use **ONE** of the processes identified in Question 1a) to illustrate your answer with a suitable example. (13 marks)
- b) Explain the role of the Class Diagram in the systems analysis phase of an Object Oriented project. (You are **NOT** required to provide a diagram.) (12 marks)
5. Briefly explain any **FIVE** of the following terms in the context of systems analysis:
- a) Feasibility Study
- b) Walkthrough
- c) Timebox
- d) CASE (Computer Aided Software Engineering) tool
- e) Non-functional requirement
- f) Stakeholder
- g) Rich Picture. (5 x 5 marks)