Cork Institute of Technology
Bachelor of Business (Honours) in Information Systems - Stage 2
(Bachelor of Business Studies in Information Systems - Stage 2)
(NFQ – Level 8)
Summer 2005
Systems Analysis & Design
(Time: 3 Hours)

Answer any **FIVE** questions from Section A
(10 marks each) and any **TWO** from Section B
(25 marks each)
Use separate answer books for each Section.
All questions carry equal marks.

**Section A**

Q1. What are 5 principles for system development?  (10 marks)

Q2. What are the advantages and disadvantages of interviewing as a fact-finding mechanism?  (10 marks)

Q3. Outline what you think is the business case for visual modelling. Include the opinions of industry experts where appropriate.  (10 marks)

Q4. Explain four ways that the feasibility of a new system can be measured.  (10 marks)

Q5. What are the critical success factors in database design?  (10 marks)

Q6. What are the characteristics of good dialogue in a User Interface?  (10 marks)

Q7. (a) What is the difference between black box and white box testing?  (5 marks)
       (b) When should a developer choose a Black Box Test and when should a developer choose a White Box test?  (5 marks)

Q8. (a) Evaluate ‘payback’ as a method of financial evaluation of a proposed system.  (5 marks)
       (b) Suggest how NPV can provide a more appropriate financial measure for proposed information systems.  (5 marks)
9. Course Registration System

Students have had mixed success with the new Course Registration System. The idea behind the system was to empower the students to register for different modules online for each Semester. The Course Registration process begins when a student accesses the Course Registration System from a designated terminal. The system is not satisfied with the Student Name and the student must enter the Student ID to access the system.

One of the really good things about the system is that it gives a menu of available modules in all disciplines to the student and details of what is contained in each module, assessment procedure, marking scheme, servicing department and so on. At any time the student can click on a command button ‘Create Schedule’. However once the student enters the ‘Create Schedule’ it is impossible to back out to the module information again. This makes sense because otherwise the student would be going back and forth for ages investigating modules and adding them to the schedule. Students should have their homework done before creating the schedule!

All a student needs to do is use their student ID number to access the system and that will give the student access to all grades received at the Institute to date in the various modules. The student is allowed to update billing and contact details as well as other personal information as necessary. Therefore a student can check to see what mark was received in a previous module before targeting another module of that subject. One of the good things about the system is that once a module is completed the student can check to see what that module is a prerequisite for.

The system requires the students to know what is mandatory and what is elective. However the system will accept anything. If there are any inconsistencies in terms of mix of mandatory and elective options the system will normally email the student within 48 hours. However, during times of high activity on the system this may not be possible. In fact response times on the system can vary dramatically depending on the time of year and time of day and day of the week. Occasionally the system will crash if it is extremely busy.

The Course Registration System allows the student to quit at any time during the registration process. However in that case it will be necessary to go through the process of registration again.

Feedback on the system has been mixed. Some students have found that it is sometimes difficult to interpret the options on the system and sufficient distinction is not made between mandatory and elective subjects on the screen. Administration finds these complaints a bit rich because the system was expensive to introduce and not so long ago the whole thing had to be done in the registration office on a form.
The administrator intends to use the system eventually to produce some useful reports and is currently doing a course to learn the Report Generator Command Language (RGCL2.6) to create them. He thinks it is worth the effort because he is the only one with the required permission to interrogate the system.

(a) Give a description of the main elements of the PIECES checklist.  
(b) Use the PIECES checklist to analyse the system described above.

10. Class Diagram Scenario based on library example.

A county library wants to create a database to control its local libraries. Each library has at least one and potentially a number of employees, one of whom is designated for supervising employees of the library. Each library stores a number of books. A citizen has to become a member of a library before he or she is allowed to borrow up to three books, but thereafter may borrow books from only that branch. Each loan is identified by an Issue No.

Books have an ISBN (International Standard Book Number) that uniquely identifies them and a Book Classification Number so that they can be identified on the shelves. Book Classification Numbers will also have a helpful description eg 900 is biography. However it is unlikely that a branch library will have a book for every classification. A book may have no author eg if it is produced by an association or professional body or it may have one or more authors. Each book will additionally have a title, a year of publication, a place of publication and a Publisher Name. Generally, a library stocks a number of copies of each book title but at least one. Each copy of a book has its own catalog number. Each copy of a book is given a release code of either reference/non loan, short term loan, usually two days or long term loan, usually two weeks.

To find an item, searches are performed based on the book title, the author’s name, the category of the book or the publishers name. A writer can be the author or co-author of a book.

(a) Show how you would represent this scenario as a UML class diagram. Include multiplicities and relationship names and direction of relationship for ease of interpretation.  
(b) State any assumptions or business rules you make.  
(c) Include a list of the tables that you derive from this class diagram together with primary keys and attributes that you would include (you can incorporate this into the class diagram if you want).
11. ATM Use Case

The Bank Customer conducts transactions at the ATM. He or she may withdraw funds, check account balances, deposit funds, and transfer amounts between accounts. A Bank Customer is created when a person opens an account at an affiliated financial institution. In the case of the ATM, focusing on several actors – the Bank Customer, the ATM Operator, and the Banking System – allows us to split the behaviour of the system into a number of smaller subsets, making the system easier to understand and less complex. Each Actor places different demands on the system and therefore requires a separate set of use cases. Here we focus on the actor ‘Bank Customer’ and the Use Case ‘Withdraw Funds’ from the ATM system.

(a) The User chooses “withdraw funds” from the menu and then selects an amount from a list of standard amounts. The ATM then confirms the transaction with the Banking System. The system dispenses money and ejects the card. However occasionally certain alternatives to the basic flow occur within the Use Case. For example a non-standard amount of money may be required or the user may attempt to withdraw more than the daily allowance. Based on your knowledge of the ATM scenario and the logical steps that would be included in a ‘Withdraw Funds’ Use Case, write a Use Case Narrative to include the two alternative steps. (10 marks)

(b) Outline two preconditions and two postconditions for the Use Case along with a business rule. Include these in your Use Case narrative. (5 marks)

(c) It is sometimes necessary to include extensions to a Use Case. In this ATM situation try to imagine what might be an alternative step that would be a good candidate for an extension. Also when a Use Case includes some functionality that may be common to other use cases, it is a good idea to reduce the complexity by breaking out this function as a separate Use Case. Suggest a good candidate for each, and give reasons for your answer. Draw a Use Case Diagram to represent your Use Case Development so far. Include two other actors who may interact with the Use Case diagram in some capacity. In your diagram include the potential <<extends>> use case and the potential <<uses>>
use case.

marks)
Systems analysis and design is a proven methodology that helps both large and small businesses reap the rewards of utilizing information to its full capacity. As a systems analyst, the person in the organization most involved with systems analysis and design, you will enjoy a rich career path that will enhance both your computer and interpersonal skills. System Analysis and Design (SAD) mainly focuses on: Systems, processes, Technology. Source: Tutorialspoint. 14. System Analysis and Design (SAD) is an exciting, active field in which analysts continually learn new techniques and approaches to develop systems more effectively and efficiently. All information systems projects move through the four phases of planning, analysis, design, and implementation (SDLC). Businesses and organizations use various types of information systems to support the many processes needed to carry out their business functions. Each of these information systems has a particular purpose or focus, and each has a life of its own. This 'life of its own' concept is called the systems development life cycle or SDLC, and it includes the entire process of planning, building, deploying, using, updating, and maintaining an information system. The development of a new information system CT026-3-1 System Analysis and Design One Pacific Health Club. announcements. The systems generates bills to be sent to all the members and reports that are to be sent to the managers. Page 6 of 58. CT026-3-1 System Analysis and Design One Pacific Health Club. 3. Project planning: 3.1 System Development Life Cycle (SDLC). Systems Analysis and Design (SAD) is a broad term for describing methodologies for developing high quality Information System which combines Information Technology, people and Data to support business requirement. The SAD technique is not only limited to IT systems and can be used to create just about anything, from a family house to the international space station.