End-Semester Examination -- Spring 2004.
IT60012 Information Systems Design

April 27th, 2004.   **Max. Marks = 100.**

Total Time: 3 Hours.

Answer All Questions. You may answer in any order but all portions of the same question must be written together.

Clearly mention any reasonable assumptions you make.

1.   **[6+6=12]**
- (a) Design a black-box test suite for a function that accepts two pairs of floating point numbers, each representing two co-ordinate points. Each pair of coordinate points represents the center and a point on the circumference of a circle. The function prints whether the two circles are intersecting, one is contained within the other or the circles are disjoint.
- (b) Consider an ER Diagram in which there are two entities E1 and E2 connected by a relation R having cardinality 1:m (1 on the side of E1 and m on the side of E2). Attributes of E1 are A11, A12 and A13, A11 being the key attribute. Attributes of E2 are A21, A22 and A23 of which A21 is the key attribute and A23 is a multi-valued attribute. Relation R does not have any attribute. Design the normalized relational tables from this ER Diagram.

2.   **[(3+6)+6 =15]**
- (a) Give three examples of information asymmetry and explain how information systems can be used to minimize information asymmetry in each of these three cases.
- (b) In a GUI, what are the different ways in which you can validate user inputs? Identify the advantages and disadvantages of each.

3.   **[6+(2+6+2)+5+4=25]**
- (a) Describe in brief, three important characteristics of the Extreme Programming paradigm.
- (b) What is system testing? Identify some of the different types of testing that are carried out during system testing of an information system. How is system testing different from beta testing?
- (c) Explain the differences between code inspection and code walkthrough giving examples of activities that are carried out during each of these two steps.
- (d) Design a test report that you can use to capture the results of testing an information system.

4.   **[(3+9)+(3+3)=18]**
- (a) Name six metrics that you should analyze while developing an information system and explain how and at what frequencies you should capture them.
- (b) Describe the activities that are carried out to meet the requirements of the following two KPAs of SEI CMM Level 3: Inter-Group Coordination (IC) and Training (TR).

5.   **[2+5+7+2+(12+2)=30]**
- (a) What are the different views and corresponding diagrams that are supported by UML?
- (b) For the IS Project that you have done as part of this course, draw the use case diagram.
- (c) Draw the class diagram for this system.
- (d) How many sequence diagrams do you need to model the dynamic behavior of this system?
- (e) Identify and describe in brief, the best practices of software development that are included in the Rational Unified Process (RUP). What are the different types of automated tool support you need to develop an information system successfully using RUP?