

Uva Wellassa University, Sri Lanka  
Faculty of Science and Technology  
Department of Computer Science & Technology  
End Semester Examination –September/October 2013  
IIT211-2 System Analysis and Design



Time Allowed: Two (2) Hours  
Answer all questions

1. a. What is an Information System? Why Information Systems are essential in organizations? (5 mark)
- b. Who are the typical stakeholders in an Information System? What are their roles? (5 mark)
- c. Identify the type of Information System that clerical workers in an organization would typically use and explain why? (5 mark)
- d. Define the unique role of System Analysts in the development of Information Systems. (5 mark)
- e. Most organizations' system development process follows problem-solving approach. State the general problem-solving steps incorporate with the problem-solving approach. (5 mark)
2. a. What is the role of DFD as a documentation aid? (2 mark)
- b. How does an analyst determine whether a person or an organization should be represented on a DFD as an external entity or one or more processes? (5 mark)
- c. State the usage of a data dictionary when constructing the DFD model of a system. (5 mark)
- d. Tic-tac-toe is a computer game in which a human player and the computer make alternative moves on a 3 x 3 square. A move consists of marking a previously unmarked square. A player who first places three consecutive marks along a straight line (i.e., along a row, column, or diagonal) on the square, wins the game. As soon as either the human player or the computer wins, a message congratulating the winner should be displayed. If neither player manages to get three consecutive marks along a straight line, but all the squares on the board are filled up, then the game is drawn. The computer always tries to win a game.  
  
Draw the context diagram and the level 1 DFD for the above Tic-tac-toe computer game. (10 mark)
- e. Write three (3) shortcomings of the DFD Model. (3 mark)

3. a. For the following statements select the suitable relationship type from Generalization, Aggregation, Composition and Association. (20 mark)

- i. Files contain records.
- ii. A hand has fingers.
- iii. Monitors and keyboards are input/output devices.
- iv. A student learns from a professor.
- v. A country has a capital city.
- vi. A file is an ordinary file or a directory file.
- vii. Every chess board consists of 64 squares.
- viii. Husband married to a wife.
- ix. Radiologist consults the lawyer.
- x. Car has accelerator, break and wheels as parts.

b. For which of the following projects would waterfall model be suitable, and why? (5 mark)

- i. an incremental compiler for Java
- ii. a clinical-record-keeping system for dentists
- iii. a word-processing package

4. a. Go through the following paragraph to understand how the elevator operates.

The control panel on an elevator allows a passenger to select a floor, open the door, close the door and declare an emergency which sounds an alarm at the elevator repair company's local office. Once a floor is selected, the elevator closes the door then begins to move either up or down. When the elevator arrives at the floor, it stops and opens the door.

Draw the use case diagram to capture the requirements for the above system. (10 mark)

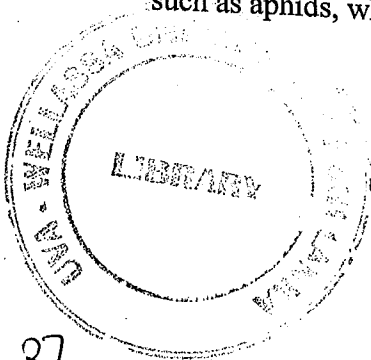
b. Translate the following domain descriptions from English into UML class diagram.

Banks manage accounts and account holders. Every account is held by an account holder. Every account holder holds one or more accounts. An account has a balance of type Money, an identification number, and a statement. A statement is a list of transactions. A transaction represents a transfer of funds to or from some other account at a particular time. Account holder is a role played by an actor. Actors have names, contact information, and identification numbers. An account holder has a password.

(10 mark)

c. Model following description by visualizing the class, relationship type and multiplicity.

A daisy is a kind of flower. A rose is a (different) kind of flower. Red roses and yellow roses are both kinds of roses. A petal is a part of both kinds of flowers. Ladybugs eat certain pests such as aphids, which may be infesting certain kinds of flowers. (5 mark)



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