

Uva Wellassa University, Sri Lanka
End Semester Examination – August/September 2011
IIT112-2 System Analysis and Design
IIT211-2 System Analysis and Design
& Repeat (IIT203-2)

1 year 2 semester

Time: Two (02) hours **Total 04 Questions** **Answer all questions**

Question 1 **(25 marks)**

- (a) What is an *information system*? Why are information systems essential in organizations?
- (b) Who are the typical *stakeholders* in an information system? What are their roles?
- (c) Define the unique role of *systems analysts* in the development of information systems. What kind of knowledge and skills should a system analyst possess?
- (d) What are the differences between *internal users* and *external users*? Give examples.
- (e) Most organizations' system development process follows problem-solving approach. State the *general problem-solving steps* incorporate with the problem-solving approach.

Question 2 **(25 marks)**

- (a) Assume you are the system analyst who will be conducting a requirement analysis for an individually owned brick-and-mortar retail store with a point-of-sale system. Identify the typical *internal* and *external users* might include.
- (b) Identify the *type of information system* that clerical workers in an organization would typically use and why.
- (c) Name the phases of *waterfall model*. Briefly describe the chief activities carried out during each phase and the corresponding entry and exit criteria.
- (d) What are the problems in *classical waterfall model*? How they have overcome?
- (e) Suggest the *most appropriate* generic software process model, which might be used as a basis for managing the development of the following systems; justify your answer.
 - i. A system to control anti-lock braking in a car.
 - ii. A virtual reality system to support software maintenance.
 - iii. A university accounting system which is intended to replace an existing system.
 - iv. An interactive system which allows railway passengers to find train times from terminals installed in stations.

Question 3

(25 marks)

- (a) What is the role of *DFD* as a documentation aid?
- (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?
- (c) State the usage of a *data dictionary* when constructing the DFD model of a system.
- (d) *Tic-tac-toe Computer Game*. Tic-tac-toe is a computer game in which a human player and a computer make alternate 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. 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, and all the squares on the board are filled up, then the game is drawn. The computer always tries to win a game.

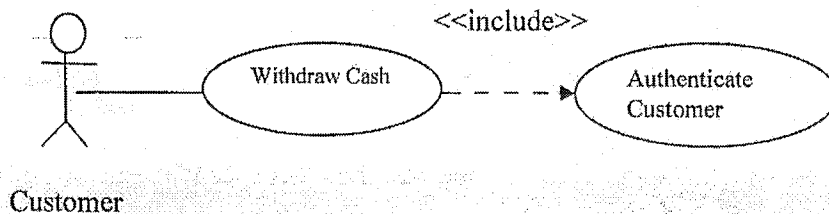
Draw the *context diagram* and the *level 1 DFD* for the above Tic-tac-toe computer game.

- (e) Write *three* shortcomings of the DFD Model.

Question 4

(25 marks)

- (a) What is the purpose of developing the *use case model*?
- (b)



Write *description* of the above use cases under the following headings.

- | | |
|-----------------------|------------------------|
| i. Use Case Name | v. Pre-condition |
| ii. Description | vi. Basic Flow |
| iii. Actor | vii. Alternative Flows |
| iv. Related Use Cases | viii. Post-condition |
- (c) Prepare the *use case diagrams* that capture the requirements for the following system;

A dentist office system has the following requirements. A patient can call to schedule a new appointment; the receptionist checks the appointment details for an available time slot. Once a possible time is available for the patient, the appointment is scheduled. It is a practice of the hospital to maintain the patient's information. So, if the patient is a new patient, an incomplete entry such as; name, address and contact number is made in this file, and the detail information such as; medical history will be

collected when the patient arrives for the scheduled appointment. They have to complete the incomplete information by filling a *patient information form*. Patient can cancel the appointment by informing the receptionist.

(d) Create *two* or *three* classes linked by associations to represent the situations below. Take care to specify appropriate multiplicity, as well as labels for the associations.

- i. Countries and their heads of state.
- ii. A student taking courses in a school.
- iii. People registering for fitness activities at a gym.
- iv. A library lending books to patrons.
- v. A repertory theatre planning presentations of various plays.

(e) For each of the associations you created in Question 4, part (d), write a sentence how you would *read* the association in both directions.

---End of Question Paper---

