RAJARATA UNIVERSITY OF SRI LANKA

FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree

Second Year – Semester II Examination – September/October 2013

COM 2401 SYSTEM ANALYSIS AND DESIGN

Answer **All** questions. Time allowed: 3 hours

Do **All** Questions in **Section A** and **three** (03) Questions from **Section B**.
Clearly state the assumptions you make. If you have any doubts regarding the interpretation of the wording of a question, make your own decision, but clearly state it on the script.

Section A

1 (a) Discuss the difference between Generic Software and Bespoke Software. [2]

(b) Name three (03) goals of each step/stage/phase in SDLC. [3]

(c) Describe what you understand by the term "virtual organization" and name three (3) benefits of a "virtual organization". [4]

(d) Name the three (03) horizontal managerial levels in an organization and name two (02) functionalities in each level. [5]

(e) Point down two (02) reasons why use cases are effective in requirements gathering. [2]

(f) Name two (02) verbal symbols and two (02) nonverbal symbols of each that can be used by a System Analyst when understanding the organizational culture. [4]

2 (a) Mention the goal of Software Project Management. [2]

(b) Why do you think Software Project Management is needed? [3]

(c) List down three (03) characteristics on how Software Project Management is different from other types of engineering project management?

[3]

(d) Name four types of project plans used in Software Project Management.

[2]

(e) What are the two areas in which main project plan is concerned with?

[1]

(f) What is the main concern in Risk Management?

[1]

(g) Name and briefly describe the four steps in Risk Management process.

[6]

(h) Explain using your own words why project planning is a continuous activity.

[2]

Section B

3 Assume you are the project manager of a software development team. Your team has been chosen to develop an Information System (IS) for the provincial Health Department to record the health information of the province. You still do not have a clear idea about the information stored, users, size of the system, capabilities of the system, etc. Before the agreement can be signed you need to propose a clear system specification. So currently you are in the interviewing process to gather information about the system.

(a) Officials at the health department do not have a good knowledge about ISs or system development.
Suggest a software development methodology considering this fact. Argue why it is the best choice.

[6]

(b) Your first interview is with the executive health committee that decided that the province needed an IS. In this interview you are hoping to identify the scope and the basic functionality of the system.
(i) When you are interviewing, explain what type (open or close ended) of questions you are hoping to ask and why.

[4]

(ii) What is the logical structure you are using to arrange your questions in? Explain why it is the best choice.

[4]

(c) During your first visit to the health department, you notice that employees there wear very formal dresses. The working areas of lower level employees are full of cupboards, paper holders, desks are crammed everywhere but you notice that everyone is provided with a PC. There are stacks of files everywhere. When you visit higher-ups the offices gets better. Your group meetings are held in a nice conference room.
Considering above observations, what is your idea regarding the management style in that department?

[2]

How would this management style affect your software development process and the final IS itself?

[4]

4 Developers have come up with various "User interaction scenarios" for the above system (System described in question 3). Below is a one of such scenario.

Prasad is a member of the planning division of the provincial health department. Currently he is working on a report on the geographical distribution of diabetes patients in the province. For this he needs to look at historical information with concern to the location. The information had been gathered and is stored in the IS. He first logs into the system using his login credentials. He would be then presented with a menu. Then he goes to the decease information section and selects the diabetes decease. Then he will go in to another menu. From there he needs select the area (in the province) and the year to get the particular information. Then he may take a printout of this. He may need to do this repeatedly for different areas and different years to get all the details he need. After all the information has been obtained he may logout of the system.

(a) Develop a hierarchical task analysis for the above scenario.

[12]

(b) The users of above (question 3) IS may not have lot of experience in using such system. Considering this fact, discuss two (2) user interface design principles you have to put special concern in to.

[4]

(d) **Safety** and **Performance** two architectural and system characteristics. Explain to what extent they can be implemented in your system considering potential architectural conflicts.

[4]

5 (a) In the above (question 3) project, some of the functionality required by the client can't be developed by the human resource available to you. Discuss two (02) solutions to this problem.

[4]

(b) The IS discussed above is going to be a web based system. Briefly describe three (03) security vulnerabilities that could affect the system and name three (03) types of attacks that could be launched against the system.

[6]

(c) Discuss two (02) advantages and two (02) disadvantages of static vs. dynamic verification.

[4]

(d) Describe what **formal methods** are and why they are important in your own words.

[3]

(e) Explain why **requirements tractability** is important?

[3]

6 (a) "Maintenance costs are reduced if the same staff is involved with them (maintenance) for some time. Even better if some of the original developers of the system are in the

maintenance team."
Discuss why it is difficult to practically implement the suggestions given by the above statements.

[4]

(b) In some software engineering projects, the contract does not cover the maintenance cost (only up to delivery and training is covered in contract). The maintenance is handled by the client. Discuss two (02) problems which could arise in these kinds of situations.

[4]

(c) Discuss two (02) problems that are mainly due to unscheduled corrective maintenance (urgent changes).

[4]

(d) Describe the four (04) scheduled maintenance activities explaining the reason/reasons to perform each activity (why they are being done) and what each activity accomplishes (what they do).

[8]