RAJARATA UNIVERSITY OF SRI LANKA
FACULTY OF APPLIED SCIENCES

B.Sc. (General) Degree
Second Year - Semester II Examination - Nov./ Dec. 2016

COM 2401 - SYSTEM ANALYSIS AND DESIGN

Time: Three (03) hours

- This paper contains **six (06)** questions on **five (05)** pages.
- Answer **one (01)** question from **Part A** and **All** questions of **Part B**.
- This examination accounts for 50% of the course assessment. The total maximum mark attainable is 100. The marks assigned for each question and section, thereof are indicated in square brackets.
- This is a closed book examination.
- Mobile phones or any other communication devices are not permitted.
- 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.

Part A

1. (a) Briefly describe the difference between **"Generic Software"** and **"Bespoke Software".**

[4 marks]

(b) Briefly describe the functions of the **"Strategic Management"** of an organization.

[3 marks]

(c) Briefly describe the advantages of **"Iterative Software Process Models".**

[3 marks]

(d) Briefly describe the advantages of **"Open-Ended Questions"** in interviews.

[3 marks]

(e) Briefly describe the difference between **"Functional Requirements"** and **"Non-Functional Requirements"** using examples.

[4 marks]

(f) Briefly describe why **"Non-Functional Requirements"** should be measurable?

[3 marks]

2. (a) Briefly describe **Two (02)** problems that happen when you describe requirements using the natural language.

[4 marks]

(b) Briefly describe **Two (02)** advantages of GUIs.

[3 marks]

(c) Briefly describe what **"Architectural Conflicts"** are.

[3 marks]

(d) Briefly describe **Two (02)** types of **"Software Security Vulnerabilities".**

[4 marks]

(e) Briefly describe what **"Automated static analysis"** is.

[3 marks]

(f) Briefly describe what **"Adaptive Maintenance"** is.

[3 marks]

Part B

3. a) Assume that you are Developing a countrywide Patient Information Management system.

The system should be able to keep track of all the patient who come to the government hospitals. System needs to consider both inpatients and outpatients (patients who are admitted and patients who come to OPD). System should contain information about patients, their condition, treatment given, reports, and the whole patient history,

Users should be able to log in and enter data to the system and view data from the system. Doctors, nurses, hospital workers and other health officers (e.g.: Hospital directors, laboratory staff, etc.) will access the system.

Data about patents (cases) should be only entered by an authorized person like a MOH. There should be separate system administrators to manage the accounts and maintain the system.

Doctors, health officials and others should be able to view data as in graphs and tables to show patterns in based on geographic areas (e.g.: MOH area, district, province). Also they should be able to view data as statistics and see future predictions so they can prepare better.

Select the **Software Process Model** that you would use for this project from the list given below. The project needs to be developed within 20 months. Describe why you are selecting it and rejecting others. Assume that the company who is developing the system is experienced at using all these models.

- Component based development
- Waterfall method
- Agile Model
- Cowboy Coding
- Spiral model

[15 marks]

b) Discuss the **Domain Requirement Problems** that you may face when gathering requirements for the above project.

[5 marks]

4. a) Discuss the possible **Use Case Actors** who are in the project described in **3 (a)**.

[6 marks]

b) Assume that the countries health ministry is the client organization in the project described in **3 (a)**. Discuss the possible stakeholders who are involved with it.

[6 marks]

c) Identify and discuss the most important **Non-Functional Requirements** associated with the project described in **3 (a)**.

[8 marks]

5. a) Assume that it is difficult to gather requirements in project described in **3 (a)** because the clients, end users and other stakeholders are not familiar with software systems. Discuss methods that you would use to solve this issue.

[10 marks]

b) Discuss the verification and validation methods that you would have used on the project described in **3 (a)**.

[10 marks]

6. a) The task durations and dependencies of a project schedule are given bellow in a table. Create the activity network according to the details given in the table. Also note that you need to identify the date of each milestone and the finished date.

- Assume that the Project start date is 1st of August 2016.
- Assume that there are no holidays except the weekends (Saturday and Sunday).
- Use the calendar given at the end of this question.

Activity	Duration (days)	Dependencies
T1	10	
T2	8	
T3	15	T1, T2 (M1)
T4	15	
T5	10	T4 (M3)
T6	5	T1, T2 (M1)
T7	15	T2, T4 (M2)
T8	25	T5, T7 (M6)
T9	15	T3, T6 (M4)
T10	15	T6, T7 (M5)

[15 marks]

c) Do you think you would be able to apply **"Lehman's Laws"** to the project described in **3 (a)**?

[5 marks]

August, 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

September, 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

October, 2016						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

END