



**RAJARATA UNIVERSITY OF SRI LANKA  
FACULTY OF APPLIED SCIENCES**

**B.Sc. (General) Degree in Applied Sciences  
Second Year Semester II Examination April/May 2015**

**COM 2401 SYSTEM ANALYSIS AND DESIGN**

**Time Allowed: 3 hours.**

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**INSTRUCTIONS TO CANDIDATES**

- This paper contains six (06) questions on five (05) pages. Answer **one** 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 two (02) main roles of a System Analyst. [3 marks]
- (b) Name the three (03) management levels in an organization. [3 marks]
- (c) Briefly describe what a **Virtual Organization** is. [2 marks]
- (d) Briefly identify two (02) disadvantages of **Cowboy coding**. [3marks]
- (e) Briefly describe the main two (02) types of interview questions. [3 marks]
- (f) Briefly describe what is known as a **Bipolar Question**. [2marks]
- (g) Briefly describe the two (02) **Measurement Scale** types. You may use examples. [4 marks]
- 2 (a) Briefly describe the differences between functional requirements and non-functional requirements. You may use examples. [4 marks]
- (b) Briefly describe two (02) types of **User Interfaces**. [4 marks]
- (c) Briefly describe two (02) human factors when designing UIs. [3 marks]
- (d) Name two (02) factors that are important when choosing a programming language. [2 marks]
- (e) Briefly describe two (02) types of attacks that can be aimed at software systems. [3 marks]
- (f) Briefly describe the two (02) main constraints in a software project. [2 marks]
- (g) Briefly describe the activities and the responsibilities of a Project Manager. [2 marks]

## Part B

- 3 **S&T** employs 400 software developers, project managers, architects, business analysts among its workforce and has a reputation as an organization which uses modern software development techniques and cutting-edge technologies. **S&T** has successfully developed CRM systems, ERP systems, Supply chain management systems, warehouse management systems for small to mid-size customers.

- (a) Assume that you are working for a software development company named **S&T Solutions**. Your job is to find available projects (projects which has been announced) and select which ones are suitable for your company. You need to consider your organizations strengths and weaknesses, risks involved among other things when you are selecting projects.

When you are looking for projects you find following projects. Describe which project/projects you are going to select and which you are going to reject, justifying your reasons.

- **Quimico Inc.** is a large chemical manufacturing company which has manufacturing plants in 45 countries. It has sales operations in over 90 countries and in 2014 had annual revenues over US\$ 30 billion. **Quimico** needs a software systems to manage all their manufacturing plants, supply chain activities, sales, operations, etc. The Software needs to be developed within 5 years and the initial maintenance contract is 12 years subject to extensions later.
- **Wysheid Institute** is a local school offering primary and secondary education. It has over 2000 students and over 100 teaching staff. The school is hoping to acquire a web based software system to manage its activities. The system should be an e-learning system and well as manage student details (grades, etc.) and the staff details (salaries, etc.) of the school. The system needs to be implemented within 12 months and the maintenance contract will be discussed later.
- **Dinero Bank** is a local savings bank which has over 5 million customers and over 1000 branches. The bank is hoping to develop an information system to manage their banking activities. The software needs to be developed within 18 months and the initial maintenance contract period is 5 years.

[4x3 marks]

- (b) Assume that you selected the software project offered by the **Wysheid Institute** in above 3 (a). Describe the software process model that you would use to develop the project considering the advantageous and disadvantageous.

[4 marks]

- (c) Assume that **S&T Solutions** is now developing the software project for the **Wysheid Institute** mentioned in above 3 (a). Currently you do not have an in-depth knowledge about the requirements of the system. Describe how you would gather requirements at the **Wysheid Institute**. Justify your answer.

[4 marks]

- 4 (a) Assume that **S&T Solutions** is developing the software system for **Wysheid Institute** mentioned in above 3 (a). Describe two non-functional requirements that may be relevant to this project. Justify your answer.

[4 marks]

- (b) Assume that you selected the software project offered by the **Quimico Inc.** in above 3 (a). Describe the software process model that you would use to develop the project consider the advantageous and disadvantageous.

[8 marks]

- (c) Assume that **S&T Solutions** is developing the software system for **Quimico Inc.** in above 3 (a). Describe the verification and validation techniques that you use during the project. Justify your answer.

[8 marks]

- 5 **Z Systems** is a software product company exclusively engaged in developing Enterprise Resource Planning systems. **Z Systems** do not develop custom (bespoke) software for each client. Their main product is called **ZSolutions** and according to the customer needs, they provide a customized versions of **ZSolutions**. **ZSolutions** is widely used by banks, financial service companies and stock brokers. **ZSolutions** is offered as number of different versions and different components. A client can choose the version and the necessary components based on their business need. There are currently four versions of **ZSolutions** available as **ZSolutions2000**, **ZSolutions2004**, **ZSolutions2008** and **ZSolutions2012** based on the year they were first released.

[4 marks]

- (a) **Z Systems** is approached by a University who needs an ERP system to manage all their activities. Should **Z Systems** accept the university as a client? Describe your answer.

[6 marks]

- (b) If **Z systems** accept the university as a client, describe the risks that they may face during the project?

[6 marks]

- (c) Describe the advantageous and disadvantageous of using a customized (generic) software product over a (bespoke) software.

[4 marks]

6 **3A Bank** is a commercial bank that is a client of **Z Systems** (which is described above question 5). **3A Bank** uses **ZSolutions2004** version system for their activities and the system has been modified a number of times during maintenance. Currently all the banks desktops are running on Windows XP and they are planning to migrate to Windows 8 platform.

- (a) The desktop client of **ZSolutions** which is currently used, is not compatible with Windows 8. Describe the type of maintenance activity that needs to be performed due to this OS migration.

[6 marks]

- (b) The **ZSolutions** software has been used by **3A Bank** for nearly 15 years. Describe your opinion about its maintenance cost (consider maintenance cost factors).

[8 marks]

- (c) Describe three (03) reasons why software needs to go under maintenance with time.

[6 marks]