

THE OPEN UNIVERSITY OF SRI LANKA
 DEPARTMENT OF MATHEMATICS AND COMPUTER SCIENCE
 B.Sc. DEGREE PROGRAMME 2013/2014
 FINAL EXAMINATION
 CPU2140: SYSTEM ANALYSIS AND SOFTWARE ENGINEERING
 DURATION: TWO HOURS ONLY (2 HOURS)



Date: 02nd December, 2014

Time: 9.30 a.m. to 11.30 a.m.

Answer **FOUR** Questions **including the QUESTION 01**.

All questions carry equal marks.

Consider the following system description to answer the questions.

An academic institute is going to design and implement a Courseware Management system that can be used to manage its courses and classes. The academic institute offers a variety of courses in a variety of areas such as learning management techniques and understanding different software languages & technologies. Each course is made up of a set of topics. Tutors in the academic institute are assigned courses to teach by considering their specialized areas and the availability. The academic institute publishes and maintains a calendar of the different courses and the assigned tutors every year. There is a group of course administrators in the institute who manage the courses including course content, assign courses to tutors, and define the course schedule. The academic institute aims to use the Courseware Management System to get a better control and visibility to the management of courses as well as to streamline the process of generating and managing the schedule of the different courses.

01

1. (a) What does <<extends >> do in UML diagrams?
 (b) Provide examples for use-case diagram(s) with incorporate <<extends >> and <<includes >> relationships.
 (c) Draw the use case diagram for the above system description.
2. Draw the class diagram for the above system description.
3. Draw the sequence diagram which shows the object interactions when courses are assigned to the tutors. A brief description of this process is given below.
 "A list of all current courses is displayed by the system. Relevant user selects the required course from the list. The system responds by displaying all tutors registered in the system. The user selects the suitable tutor by looking at his/her specialization and availability. Finally, the user assigns the tutor for the particular course and updates the corresponding record."

02

1. (a) What are the drawbacks of the Waterfall Model? Outline an alternative software development model that deals with these drawbacks.
 (b) Propose a suitable software process model for above system. Justify your answer?
2. (a) Describe the major properties that should be taken to ensure software is a good one.
3. Identify and describe the role of upper and lower CASE tools in various phases of the software development life cycle.

03

1. "Project planning is an iterative process". Comment on this statement.
2. Assume that you have been appointed as the project manager for the above software development project. Briefly describe the way you would plan the software development project for the above system.
3. (a) List down the three (03) categories of risk in a project.
(b) Name the category that the risk "Staff Turnover" should belong and explain how you minimize it as the project manager of the above system.

04

1. In the context of the software development life cycle, define "user requirements", and explain how they relate to the implementation of a software system.
2. What is meant by non-functional requirements and make a non-functional check list that can be used for the above Courseware Management System.
3. Assume there is a requirement change in the above system. Discuss how you manage it.

05

1. Briefly describe the essentials of component-based software engineering.
2. What are the pros and cons between object modular decomposition and pipeline modular decomposition?
3. Identify the types of testing and describe the purpose of doing each type of testing for the above system

06

1. Briefly describe the steps you would carry out when you are implementing the Courseware Management System in the academic institute.
2. (a) What are the four (04) types of software maintenance?
(b) Suppose the management wants to introduce the mobile version of the above system. What kind of maintenance do you suppose to do? Give the reason(s) for your answer.
3. How does software configuration management help to manage the software development and maintenance?

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