Software Engineering

Date: Friday 29th January 2016
Time: 09:45 - 11:15

Answer ALL Questions in Section A
Write your answers directly on the exam paper. Only answers written in the boxes on the exam paper will be marked.

Answer ONE Question from Section B, use a separate answerbook for this Section

This is a CLOSED book examination
The use of electronic calculators is NOT permitted
Section A

This Section contains Multiple Choice Questions and is therefore restricted
Answer one of the two questions in this part.

2. Consider the following scenario:

An employment company (EC) has commissioned a software firm to develop a job application software system to support their application process. EC wants the system to be a web-based so that job applicants can submit their application online. EC also requires that the application data be kept in a database and shared by the company’s data analytic tool.

Applicants need to register with the system before using it. One logged on, they must be able to browse the job catalogue, select one or more jobs, fill in the application forms one by one, and upload their CV with each application.

Front officers of EC will screen all applications on a daily basis and pass on the qualified applications to their senior colleagues who will then process the applications online. The processed applications will then be passed on to prospective employers who can then assess the applications online.

EC anticipates that there will be more than 1000 users of their system each day. They also want the system to support visually impaired people by providing a user-friendly interface.

a) In the above scenario, list all the actors. For each actor, state the reason why it is an actor.

(5 marks)

b) According to the given scenario, draw a Use Case Diagram to show all the actors and all the use cases of the system.

(8 marks)

c) Complete the following use case specification for “Apply for Job”.

(Question 2 continues on the following page)
3. a) i) Briefly explain what a structural model is. (2 marks)
   ii) Briefly explain what a behavioural model is. (3 marks)

b) Consider the following scenario:

   A university department is belatedly planning to install a software system to provide administrative support to lecturers and students, as well as the departmental tutor who oversees the administration of course units.

   The tutor is responsible for drawing up the list of approved course units, assigning them to lecturers, gathering links for course unit materials, and generating class lists for the course units.

   (Question 3 continues on the following page)
(Question 3 continues from the previous page)

Lecturers have to prepare materials for course units assigned to them, and upload links to these materials. They will need to get class lists for these course units for the purpose of checking attendance and recording assessment marks.

Students have to register for course units of their choice. Once registered, they can access the materials for these course units.

The use case diagram is as follows:

All the databases are set up and maintained by the departmental tutor.

i) Identify domain classes that realise the use cases, and outline the class diagram for the domain model. Explain and justify your answer. (5 marks)

ii) Suggest suitable system classes that refine the domain classes. Outline a class diagram for the system classes. (5 marks)

iii) Draw a sequence diagram for the realisation of the ‘Get class list for course unit’ use case. (5 marks)