Semester 1 Examinations, 2017/2018

Exam Code	3BCT1, 1EM
Exam	3rd University Examination in Computer Science and Information Technology
Module Code	CT5106
Module	Software Engineering II
Paper No.	1
External Examiner **Internal Examiners**	Dr. Jacob Howe Dr. Michael Schukat Dr. Owen Molloy *
Instructions	You must answer **any 3** questions (each question is marked equally). *(Marks will be adjusted to total 100%.)*
Duration	2hrs
No. of Answer Books	1
Requirements	None
No. of Pages	4

1. A Java Enterprise application must implement a simple Registration function using Servlets and JSP. You must also use a Java Bean data class for the User, and a DAO (Data Access Object using embedded SQL) class to handle persistence of the User class. The User class simply contains the *username* and *password* of the new user.

a) Describe, using a simple diagram, how the Model View Controller architecture is implemented in this application.

[10 marks]

b) Write the HTML code for the Registration.html page. This page would simply contain a form which calls the Registration Servlet. The form is used to input the username and password used to register.

[10 marks]

c) Write the Java code for the servlet. You do not have to write the code for the DAO class – just assume that it is already written, and use appropriate methods which you would expect it to have.

[13 marks]

2. A servlet creates a List of Module objects, where each subject object has the properties *moduleCode*, *moduleName* and *moduleDescription*. For example:

moduleCode = "CT2104"
moduleName = "Web Application Development"
moduleDescription = "Web Development Using Java Server technology"

The servlet adds this List to the session object and forwards to a JSP page where the list of modules is displayed as a table, using JSTL to handle the retrieval of the list of modules from the session, and the iteration over the list of modules.

(a) Explain the difference between request scope, session scope and application scope in JEE applications.

[5 marks]

(b) Explain, using an example, how you would use Expression Language in a JSP page to retrieve data from a session.

[10 marks]

(c) Write the JSP page code.

[18 marks]

3. Assume you have a Java Bean entity class, called Product, which has the following properties.

```
private String productCode;
private String productName;
private String productDescription;
private double price;
```

You may assume that a Façade session bean class has been created for Product. A HTML form is submitted to a servlet. The form contains the necessary input parameters to create a new Product object.

a) Write the JPA-annotated Product entity class. The primary key is the product code. You do not need to write the *getter* and *setter* methods. The Product object data will be stored in a table with a different name ("Stock").

[15 marks]

b) Write the servlet code necessary to retrieve the request parameters. Use the Façade class to create and persist the new Product object.

[18 marks]

4. You have been asked to manage a project which involves the design, implementation, test and rollout of a new online booking system for a small theatre. Answer the following questions in relation to this project.

a) Explain how you would go about performing the Stakeholder Analysis and outline the kinds of information which you would need to capture.

[15 marks]

b) Describe the most important stakeholders in the project, and what specific issues might arise or need to be handled with respect to them.

[8 marks]

c) What would you expect to be contained in the Communications Management Plan for the project?

[10 marks]

5. As part of a new project to develop a JEE online shop application, you are asked to manage the estimation of the development cost. So far, the requirements have been described using detailed Use Case diagrams and descriptions.

a) Explain the steps involved if you were to perform an estimation of the project duration (development hours) using the Use Case points methodology

[15 marks]

b) Provide 2 examples of each of the following as used in estimation by Use Case Points:

- Actor Weight

[6 marks]

- Technical Complexity Factor

[6 marks]

- Environmental Complexity Factor

[6 marks]

6. As part of a new project to develop a new mobile phone app, you are asked to set up the Agile planning process. So far, you have received the Product Backlog from the customer

a) Explain how you would do an initial estimate, of the story points needed for each item in the Product Backlog, using Planning Poker with your agile team.

[10 marks]

b) Describe how you would create a Release Plan for the project sprints, based on initial velocity estimates, and how you would adjust your estimates and sprint planning as the project progresses.

[12 marks]

c) Sketch and explain examples of the two main types of burndown charts which you would use to track progress in the project and its sprints. Explain how they can be used to highlight problems with under-estimation or over-estimation.

[11 marks]