



Semester 1 Examinations, 2016/2017

Exam Code	3BCT1, 1EM
Exam	3 rd University Examination in Computer Science and Information Technology
Module Code	CT5106
Module	Software Engineering II
Paper No.	1
External Examiner Internal Examiners	Dr. John Power Dr. Jim Duggan Dr. Michael Madden Dr. Owen Molloy *
Instructions	You must answer Question 1 (40 marks) and any other 2 questions (30 marks each).
Duration	2hrs
No. of Answer Books	1
Requirements	None
No. of Pages	3

- 1.** You must answer this question. Answer all 8 parts of this question. Answers should be concise. Each part is worth **5** marks. **This question is worth 40 marks in total.**

- a) Explain briefly your understanding of the Model-View-Controller architectural pattern.
- b) Explain the purpose of the `urlPatterns` annotation as found in servlets, for example:

`@WebServlet (name = "dataServlet", urlPatterns = {"/dataServlet"})`
- c) Explain the difference between request scope, session scope and application scope in JEE applications.
- d) Add the JPA annotations `@Entity`, `@Table`, `@Column`, `@Id` to the following Java bean class:

```
public class Supplier
{
    private int id;
    private String name;
    private String description;
}
```

- e) Please provide the 3 lines of code that you would include in a JSP page that would declare a variable (integer `i`), and then increment and print it out every time the JSP page was called.
- f) Explain the following Project Management terms (as used in Gantt charts):
 - i) Critical Path
 - ii) Lead Time
 - iii) Task Dependencies
- g) Explain the meaning of the following terms in Ant build files:
 - i) `target`
 - ii) `destfile`
 - iii) `srcdir`
- h) List briefly what you see as the main differences between a group-based estimation method, such as Planning Poker, and size-based estimation, such as Use Case Analysis.

- 2.** A JSP/servlet application must implement a simple `Registration.html` page in HTML, which contains a form where the user enters their username and password. The form is submitted to the `doPost` method of a servlet which must retrieve the form parameters. The servlet uses a Data Access Object class to first check if the user name already exists. If the user already exists, then a message is added to the request and it is forwarded to a `RegistrationFailed.jsp` page where the message is printed out. If the user doesn't already exist, the DAO is used to create the user, and then the servlet forwards to the `Login.jsp` page.

- (a) Write the HTML code for the `Registration.html` page.

[15 marks]

- (b) 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 you would expect it to have.

[15 marks]

- 3.** A servlet creates a list of User objects, where each user object has the properties firstName, surname, age and gender. The servlet adds this list to the session object and forwards to a JSP page where the list of users is displayed as a table.

(a) Write the Java code for the servlet.

[15 marks]

(b) Write the JSP page code.

[15 marks]

- 4.** Assume you have a Java Bean entity class, called Car, which has the following properties. You may also assume that the class is persistable and annotated correctly using JPA, and that a Façade session bean class has been created for Product.

```
private String registration;  
private String make;  
private String model;  
private int mileage;  
private double price;
```

A HTML form is submitted to a servlet. The form contains the necessary input parameters to create a new Car object. Write the servlet code necessary to retrieve the request parameters and use the Façade class to create and persist the new Car object.

[30 marks]