NUI Galway
OÉ Gaillimh

Autumn Examinations, 2016/2017

Exam Code	3BCT1
Exam	3rd University Examination in Computer Science and Information Technology
Module Code	CT5106
Module	Software Engineering II
Paper No.	1
External Examiner	Dr. John Power
Internal Examiners	Prof. Peter McHugh Dr. Michael Schukat Dr. Owen Molloy*
Instructions	You must answer **Question 1** (50 marks) **and any other 2 questions** (25 marks each).
Duration	2hrs
No. of Answer Books	1
Requirements	None
No. of Pages	5

1. ***Compulsory*** *(you must answer this question)* Answers should be concise. Answer all parts. Each part is worth [**5**] marks.

1.1. 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.

1.2. Explain the difference between *request scope*, *session scope* and *application scope* in JEE applications.

1.3. What information should a "Product Backlog" contain?

1.4. Explain the purpose of the urlPatterns annotation as found in servlets, for example:

```
@WebServlet(name = "dataServlet", urlPatterns = {"/dataServlet"})
```

1.5. Explain the meaning of the following terms in Ant build files:

a) "target"

b) "attribute"

c) "depends"

1.6. If you are using Planning Poker for estimation in an Agile project, what are the steps that the team should follow in playing?

1.7. Assuming the following lines of code are executed in a servlet, and that the request is then forwarded to a JSP page, write the JSP code necessary to print out the product's name and price:

```
p1 = new Product();
p1.name = “Widget”;
p1.price = 45.00;
```

```
session.setAttribute (“product”, p1);
```

1.8. Explain the difference between the following 2 lines of JSP code, and what will happen when they are executed:

```
<%! int count_1 = 0; %>
<% int count_2 = 0; %>
```

1.9. Explain the following Project Management terms (as used in Gannt charts):

a) *Critical Path*

b) *Lead Time*

c) *Task Dependencies*

1.10. Add the JPA annotations @Entity, @Table, @Column, @Id to the following Java bean class:

```
public class User implements Serializable
{

private int id;

private String name;

}
```

2. Assume you have a Java Bean class, called Book, which has the following properties (you can assume the getters and setters are also already written):

```
private String title;
private String author;
private double price;
private int ID;
```

Assume also that you are given initial code for a servlet, as show below:

```
protected    void    processRequest(HttpServletRequest    request,
HttpServletResponse response)
            throws ServletException, IOException {

Book b1 = new Book ("C++", "J. Smith", 50.00, 101);
Book b2 = new Book ("Java", "S. Jones", 45.00, 102);
Book b3 = new Book ("C#", "B. Moore", 39.95, 103);
Book b4 = new Book ("HTML5", "D. Webb", 25.00, 104);
```

(a) Finish the java code for the servlet. The servlet code must be finished so that it adds the books to a List object. The List object must be added to the **session** as an attribute, and control forwarded to a JSP page.

[15 marks]

(b) Write the JSP page code, where the books must be displayed as a table.

[10 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.

[10 marks]

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

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

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 Car.

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.

[25 marks]