Autumn Examinations, 2018/2019

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 **Internal Examiners**	Dr. Jacob Howe Dr. Michael Madden Dr. Owen Molloy *
Instructions	You must answer **<u>any</u> 3** questions. Each question is worth the same number of marks. *(Marks will be adjusted to total 100%.)*
Duration	2hrs
No. of Answer Books	1
Requirements	None
No. of Pages	4

1. Answer all 8 parts of this question. Answers should be concise. Each part is worth **5** marks.

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) What is the purpose of a Daily Scrum meeting in Agile, and what questions should scrum team members answer?

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

```
private String id;
private String lastname;
private String firstname;
```

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

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

[10 marks]

b) Write the HTML code for the input form.

[10 marks]

c) Write the servlet code necessary to retrieve the request parameters, and use the Façade class to create and persist the new Person object.

[20 marks]

3. You have been asked to manage a project which involves the design, implementation, test and rollout of a new online hotel booking system. 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.

[20 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.

[10 marks]

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

[10 marks]

4. As part of a new project to develop a JEE online booking application for a community hall, 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

[25 marks]

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

- Actor Weight

[5 marks]

- Technical Complexity Factor

[5 marks]

- Environmental Complexity Factor

[5 marks]

5. As part of a 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.

[15 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.

[15 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.

[10 marks]