TECHNOLOGICAL UNIVERSITY DUBLIN

COLLEGE OF BUSINESS

AUNGIER STREET

Programme: BSc Business Computing

DT354 Year 3

Semester 1 Examination

January 2019

Module: Web Development 1 (Java)
Module Code: INFS3031

Internal Examiner: Dr J Munnelly

External Examiner: Dr Eoin Whelan

Exam Duration: 3 hours

Instructions: Answer any 4 questions

1.

   a. Oracle describe the use of Java Sockets: "Sometimes your programs require lower-level network communication, for example, when you want to write a client-server application".
Show the code required to write a client-server application using Sockets over a reliable transport protocol. Allow the client and server to send String messages to each other until either enters "Goodbye". Include, using pointers, explanations of the code to demonstrate your understanding.

(18 marks)

   b. The java.net package contains classes to help you write Socket applications over different transport protocols. Outline the implementation details to send/receive using 3 types of Socket, including details of the classes used in each and how they are used.

(7 marks)

[25 marks]

2.

   a. Java servlets are server-side programs (running inside a web server) that handle clients' requests. Explain how they work and outline an example application that allows customers to leave their name feedback in a webpage for an online shop. The user should be sent to a customised "Thank you *NAME* for your feedback" page where "*NAME*" is the customer's name. Include your Servlet, webpage and configuration files where required.

(20 marks)

   b. What kind of request did you process in the Feedback Servlet? What other kinds of requests exist? What method in the Servlet Lifecycle processes requests?

(5 marks)

[25 marks]

3.

a. JDBC is a standard for connecting to databases directly. Using your knowledge of JDBC outline the code required to insert a record into the database outlined below (use a Statement). Include in the code functionality to allow the retrieval of the records (use a PreparedStatement and print the values out to the console) and to update an address.

```
mysql> use emails;
Database changed
mysql> CREATE TABLE Persons (
    ->     PersonID int,
    ->     LastName varchar(255),
    ->     FirstName varchar(255),
    ->     Address varchar(255),
    ->     City varchar(255)
    -> );
Query OK, 0 rows affected (0.20 sec)
```

Include pointers in your code to explain all important classes, methods etc. Include longer explanations after the code where required to demonstrate your knowledge e.g., the difference between Statement and PreparedStatement, return types of all JDBC methods etc.

(25 marks)

[25 marks]

4.

a. Outline an application to show the use of Tag Libraries in JSPs. Your application should take in 3 items, add them to a Collection in a ShoppingList class and display all the items in the Collection on the resulting JSP.
Explain all the tags you use in your application, and explain the functionality of each tag. Include your JSPs any other file interacting with them in your answer.

(15 marks)

b. As HTML is a stateless protocol, developers must include state and session management programmatically. Show how you have implemented this in your coursework. Include all relevant code and explain it in detail.

(10 marks)

[25 marks]

5.

   a. Using the Struts2 Web Framework, outline a solution that allows users to request their Local Property Tax details. The user should enter their PPSN (user identification number) and Unique Property ID, the application should log the request, enter the PPSN in the session and return a page to the user showing their details on the page with a message to confirm that their request has been logged. Note, no database functionality is required. Include all source files, webpages and configuration files required.
   Include a full explanation of how the Web Framework functions(including the sequence of events), and of all your code.

   (25 marks)

   [25 marks]