DUBLIN INSTITUTE OF TECHNOLOGY

DT211C BSc. (Honours) Degree in Computer Science (Infrastructure)

Year 4

WINTER EXAMINATIONS 2016/2017

RICH WEB APPLICATION TECHNOLOGY [CMPU4043]

INTERNAL EXAMINER
MR. BRIAN GILLESPIE
DR. DEIRDRE LILLIS
EXTERNAL EXAMINER
MR. THOMAS NOLAN

THURSDAY 5TH JANUARY 9.30 A.M. – 11.30 A.M.

TWO HOURS

Question 1 is **compulsory.**
Answer question 1 **and** any two of the other three questions.
Question 1 is worth 40 marks, all other questions are worth 30 marks

Illustrate your answers with appropriate examples and diagrams

1 (a) Give your definition of a rich web application. Briefly describe the typical technologies used and their roles in the construction of a rich web app.

(8 Marks)

(b) What is the Document Object Model (DOM)? Explain how a programmer interacts with the DOM using the native DOM API. Give a Javascript code example to illustrate your answer.

(8 Marks)

(c) In functional programming, what is meant by a functor? Give an example of a functor and its usage in Javascript.

(8 Marks)

(d) Briefly describe the Javascript Object Notation (JSON) standard using an example to illustrate your answer. State why JSON has become the de facto data serialisation format in rich web application development

(8 Marks)

(e) Explain how the XMLHttpRequest API is used in browser networking. Illustrate your answer with example code in Javascript

(8 Marks)

2 (a) WIth the aid of example code, describe the Cascading Style Sheets (CSS) Flexbox Model and show how it can be used to layout DOM elements.

(10 Marks)

(b) Describe, with examples, how Cascading Style Sheets allow for code reuse across multiple elements in the DOM. Compare and contrast this approach of code reuse with that of using Javascript functions to directly style elements using the style property. In your opinion, which approach offers the most flexibility and why?

(20 Marks)

3 (a) Briefly describe, with examples, each of the following approaches for handling asynchronous

program execution. Mention briefly the greatest potential concern of using callbacks.

- Callback functions
- Promises
- Observable streams

(10 Marks)

(b) The different roles played by HTML, CSS and Javascript in web development have been described as a separation of concerns between layout, styling and behaviour. What is your opinion of this characterisation? Compare this with the separation of concerns approach offered by the component abstraction. In particular, mention the advantages and disadvantages of each with respect to code reuse and maintainability.

(20 Marks)

4 (a) Using an example of your choice, describe the Elm Architecture of web application development

(10 Marks)

(b) Javascript and Elm support a functional programming paradigm. Explain what is meant by functional programming, mentioning the important features that a language must support in order to be considered functional. In your opinion, why do you think this style has become so popular in rich web application development in recent years?

(20 Marks)