GALWAY-MAYO INSTITUTE OF TECHNOLOGY

AUGUST/RESIT EXAMINATIONS 2015/2016

MODULE: COMP07048 – DATA REPRESENTATION AND QUERYING

PROGRAMME(S):

GA_KSOFG_B07 BACHELOR OF SCIENCE IN SOFTWARE DEVELOPMENT

YEAR OF STUDY: 3

EXAMINERS:

Dr Ian McLoughlin	(Internal)
Dr Michael Schukat	(External)
Mr Tom Davis	(External)

TIME ALLOWED: 2 Hours

INSTRUCTIONS: Attempt 4 questions. All questions carry equal marks.

PLEASE DO NOT TURN OVER THIS PAGE UNTIL YOU ARE INSTRUCTED TO DO SO.

Programmable or text storing calculators, smart phones/watches or any other electronic devices are expressly forbidden in the Examination Hall.

Requirements for this paper (Please mark (X) as appropriate):

☐	Log Tables	☐	Thermodynamic Tables
☐	Graph Paper	☐	Actuarial Tables
☐	Dictionaries	☐	MCQ Only – Do not publish
☐	Statistical Tables	☐	Attached Answer Sheet
☐	Bible		

Question 1

You have been given the role of Head Webmaster at a company called Compy. You hold a meeting with your team to discuss how the website currently works.

(a) Explain what a resource is, in the context of HTTP. (20 marks)

(b) Explain how a resource can be dynamically generated from a database. (20 marks)

(c) Would you expect a static file resource or a dynamically generated resource to be delivered more quickly to the user? Explain your answer. (10 marks)

Question 2

A hedge fund called OldHedgy have no in-house computing expertise. All of their employees are financial accountants. They have decided, however, to create a web application to keep track of stocks. They have contracted your company to develop it for them.

(a) Explain how HTTP works, including the Request-Response model. (20 marks)

(b) Explain the various parts of the following example URL:

`http://john:balloons@www.oldhedgy.com:81/AAPL/?nodays=3`

(20 marks)

(c) Explain what happens when a client requests a resource that does not exist. (10 marks)

Question 3

Carpedia is a wiki about cars. Users of the site can browse through various car-related articles. Carpedia also makes the information available in JSON format through an API.

(a) Explain what JSON is. (20 marks)

(b) Carpedia have a table called *carmodels* in a relational database which contains the following fields: *id* (an integer primary key), *make* (a text field containing the make of the car), *model* (a text field the model of the car), *stillprod* (a boolean flag indicating whether the car is still in production). Give an example of a JSON representation of a single record in that table, using appropriate sample values for the fields. (20 marks)

(c) Is the following code valid JSON? Explain your answer.

`{ id: 100 }`

(10 marks)

Question 4

You work for Microsoft and are giving a presentation to your colleagues on the use of XML.

(a) Explain what is meant by XML. (20 marks)

(b) Explain the difference between elements and attributes in XML, and give one example of when an element must be used over an attribute. (20 marks)

(c) Explain the Document Object Model. (10 marks)

Question 5

You have an interview for Google, and they ask you the following technical questions. Answer each of them.

(a) Explain what a page refresh is in the context of HTTP and web browsers. (20 marks)

(b) Explain, with reference to any webmail application, what an AJAX call is. (20 marks)

(c) Explain why AJAX calls are usually asynchronous, rather than synchronous. (10 marks)