



**Galway-Mayo Institute of Technology**  
**August/Resit Examinations 2016/2017**

**MODULE:** COMP07048 – Data Representation and Querying

**PROGRAMME(S):**

GA_KSOFG_B07	B.Sc. Software Development
GA_KCDMG_H08	B.Sc. (Hons) Computing and Digital Media

**YEAR(S) OF STUDY:** 3, 4

**EXAMINERS:**

Dr Ian McLoughlin	(Internal)
Dr Martin Kenirons	(Internal)
Dr Des Chambers	(External)
Mr Tom Davis	(External)

**TIME ALLOWED:** 2 hours

**INSTRUCTIONS:** Answer 3 questions. All questions carry equal marks.

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The use of programmable or text storing calculators is expressly forbidden. Please note that where a candidate answers more than the required number of questions, the examiner will mark all questions attempted and then select the highest scoring ones.

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There are no additional requirements for this paper.

### Question 1

You are a developer working for the Apache Foundation. Your team leader has asked you to explain in writing the following HTTP concepts to a new junior team member. The new team member has some knowledge of front-end web development and programming in JavaScript but does not know how a web server works.

- (a) Explain the request–response model used in HTTP. (40 marks)
- (b) Explain the structure of a HTTP request. (40 marks)
- (c) Explain what HTTP status codes are, listing two examples of status codes and explaining what they mean. (20 marks)

### Question 2

The Revenue is developing a new web application in which income taxpayers will be able to check the status of their personal tax credits.

- (a) Describe what a HTTP resource is in the context of a web application such as the Revenue's. (40 marks)
- (b) Explain why and how some HTTP resources served in the Revenue's web application might be generated dynamically. (40 marks)
- (c) Explain what it means for a resource to be *cacheable*, and give an example of a resource that the might be cacheable in the Revenue's web application. (20 marks)

### Question 3

You have been asked to test the HTTP API of a small web application called Joulez. Joulez allows users to view, save and update details of their daily calorie intake.

- (a) Explain what the popular command line application `curl` does, and how it might help in testing Joulez. (40 marks)
- (b) Most of the HTTP API in Joulez works through the use of URL encoding. Explain what URL encoding is. (40 marks)
- (c) Joulez currently allows users to log in using the GET HTTP method. State whether you think this an appropriate HTTP method to use, and explain your answer. (20 marks)

#### Question 4

A logistics company called Tripsical is developing a new information system where data about vehicles such as trucks, planes and boats can be stored. The kind of information the system must store will differ from vehicle to vehicle. They have asked you to consult on the project.

- (a) Tripsical has heard that CouchDB might be a good solution for their requirements, as it stores data in JSON. Explain what JSON is. (40 marks)
- (b) Explain why a SQL database is usually not considered to be a good fit for unstructured data such as Tripsical's. (40 marks)
- (c) Tripsical plan to build a web-based front-end to their system, using AJAX calls to tie the front and back ends. Explain what AJAX is. (20 marks)