



OLLSCOIL NA GAILLIMHE
UNIVERSITY OF GALWAY

Semester 2 Examinations 2022-2023

Course Instance 2BCT
Code(s)
Exam(s) Second Year BSc Computer Science and Information Technology

Module Code(s) CT216
Module(s) Software Engineering 1

Paper No. 1

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Instructions: Answer any three questions, all questions carry equal marks.

Duration 2 hours
No. of Pages 4
Discipline(s) Computer Science
Course Co-ordinator(s) Dr Colm O'Riordan

Requirements:

Release in Exam Venue	Yes [X]	No []
MCQ Answersheet	Yes []	No [X]
Handout	None	
Statistical/ Log Tables	None	
Cambridge Tables	None	
Graph Paper	None	
Log Graph Paper	None	
Other Materials	None	
Graphic material in colour	Yes []	No [X]

PTO

Question 1:

a) With the aid of examples outline the meaning and define the following terms in your own words:

- a. SCRUM
- b. The Waterfall Model
- c. Pair Programming
- d. Test Driven Development

[12 marks]

b) In the context of Software Testing, describe in your own words the following:

- a. Black box testing
- b. White box testing

[8 marks]

Question 2:

a) Explain in your own words how the grid system in Bootstrap works. In your answer discuss the purpose of rows and columns and describe how the grid facilitates responsive design.

[5 marks]

b) Provide the HTML and corresponding Bootstrap classes to split a row into two separate sections, each sized 6 columns wide on a large device and medium device. In the case of smaller devices, the columns should stack on top of each other.

[6 marks]

c) What are style classes? Give an example of a class and an id based CSS selector.

[4 marks]

d) Explain what the CSS box model is? In your answer detail the difference between CSS margin and padding.

[5 marks]

PTO

Question 3:

- a) Using JavaScript, write code to iterate through an array of objects (called myArray), removing objects placed at **odd** index positions in the array. Assume the array contains 8 vehicle objects which take the following form ({**make**: "Ford", **model**: "Focus", **age**:2} , ... , {**make**: "Toyota", **model**: "Yaris", **age**:5}). You may use the splice method to remove the objects from the array, however each time splice is called it will re-index the array. To counter this you should iterate through the array in reverse.

[6 marks]

- b) Write the HTML and corresponding JavaScript code that upon button click reads 3 numbers from 3 text boxes and doubles each number before saving it in the text box it came from.

[6 marks]

- c) VueJS supports a concept known as 2-way data binding. Explain what this is.

[4 marks]

- d) In VueJS explain what Single File Components are.

[4 marks]

PTO

Question 4:

You have been asked to build a server backend using Firebase, which comprises a collection of RESTful APIs built using Firebase functions and a Firestore database. The backend is designed to support an Instagram style application. Each image shared by the users of the application should contain a description of the image, the upload time and date, the number of likes and the number of re-shares.

- a) Provide a sample JSON document which contains data for a single image shared on the platform.
[4 marks]
- b) Write the NodeJS code to create a server-side API using Firebase Functions which returns all image documents in the collection, sorted in **ascending** order by upload time.
[5 marks]
- c) Write the NodeJS code to create a server-side API using Firebase Functions which is used for accepting the image data sent via POST to the server. Assume that the request body contains JSON data. Prior to saving check the request body to see if there is a description. If no description is provided then the response to the user should be *image not saved* and no data should be saved in the database. If a description is provided then the data should be saved and the response to the user should be *image saved successfully*. Provide code to save the data in the request body to the Firestore database.
[6 marks]
- d) Write the NodeJS code to create a server-side API using Firebase functions which deletes individual documents from the collection by parsing the query string, extracting the id and removing the document found.
[5 marks]

END