

S228/204

DUBLIN INSTITUTE OF TECHNOLOGY  
KEVIN STREET, DUBLIN 8

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**BSc in Computer Science**

**Year 2**

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**Summer Examination 2002**

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**Web Development**

Mr. C. O'Leary  
Dr. B. O'Shea  
Prof. A.T. Whitehouse

**Three (3) Hours**

Attempt **Question 1** and any **THREE** other questions

All questions carry equal marks.

## Section A

### Compulsory

1. Attempt any 5 of parts (a), (b), (c), (d), (e) and (f).
  - (a)
    - (i) Explain what is meant by RGB colours. Using just HTML code show how RGB colours can be created and used to set the background colour of a page. **(2 marks)**
    - (ii) Using sample code show how CSS can be used to set the background colour of a page. **(3 marks)**
  - (b)
    - (i) Using HTML code show how to include a Java Applet in a page. Explain any tags and attributes you use. **(1 mark)**
    - (ii) List and explain the steps that take place between the client and the server as an applet is downloaded and run in a browser. **(4 marks)**
  - (c)
    - (i) Explain the difference between JavaScript and CGI. **(2 marks)**
    - (ii) Using HTML code show how JavaScript code is included in the head of a document. How is backward compatibility with older browsers ensured? **(3 marks)**
  - (d)
    - (i) Why is JavaScript not considered a *strongly typed language*? **(2 marks)**
    - (ii) Write a piece of JavaScript code to read a number from a user and display the square root of that number. **(3 marks)**
  - (e)
    - (i) What are *events* in JavaScript? Give two examples. What are always associated with events? **(2 marks)**
    - (ii) Provide a piece of JavaScript and HTML code which makes use of two events. Explain the purpose of the events. **(3 marks)**

(f) (i) What is XSL?

(1 mark)

(ii) Give the XSL stylesheet necessary to display the following XML document as the table shown beneath it.

(4 marks)

```
3 <?xml version="1.0"?>
4 <?xml:stylesheet type="text/xsl" href="subjects.xsl"?>
5 <COURSE>
6   <SUBJECT SUBJECTID="oo">
7     <LECTURER>Paul Kelly</LECTURER>
8     <TITLE>Object Oriented Programming</TITLE>
9     <TOPIC>C++</TOPIC>
10  </SUBJECT>
11
12  <SUBJECT SUBJECTID="wd">
13    <LECTURER>Ciaran O'Leary</LECTURER>
14    <TITLE>Web Development</TITLE>
15    <TOPIC>HTML</TOPIC>
16  </SUBJECT>
17
18  <SUBJECT SUBJECTID="os">
19    <LECTURER>Fred Mtenzi</LECTURER>
20    <TITLE>Operating Systems</TITLE>
21    <TOPIC>UNIX</TOPIC>
22  </SUBJECT>
23 </COURSE>
24
```

Lecturer	Title	Topic
Paul Kelly	Object Oriented Programming	C++
Ciaran O'Leary	Web Development	HTML
Fred Mtenzi	Operating Systems	UNIX

## Section B

### Attempt any THREE Questions

2. (a) Give a brief definition of what the *Internet* is. **(2 marks)**
- (b) Layering is a technique used in computer networks to separate protocols. Imagine a scenario where a three layer protocol stack is comprised of a *network layer*, a *transport layer* and an *application layer*. Identify which protocols operate at each of these three layers on the Internet and describe the purpose of each of these protocols. Then show how a small piece of data could be sent from a web server to a web browser using the various protocols. You should use diagrams in your answer. **(13 marks)**
- (c) The Domain Name Service (DNS) is used to resolve domain names with IP addresses. Explain, using a **detailed** example, how it does this. **(10 marks)**
3. (a) “Users ought to be strongly involved in a web development project.” Discuss the extra factors that a developer must consider when developing a web site or web application, as opposed to a standard application? Outline why this makes user involvement so important in web development projects. **(5 marks)**
- (b) List the seven stages of the Lazar Web Development Lifecycle. Discuss what takes place at each stage, outlining how users get involved. **(12 marks)**
- (c) You are given the task of managing a web development project for a primary school. The school wants to make information available for parents, students and teachers. Identify the methods you would use at stages two and five of the development lifecycle. Discuss why you decided upon these methods, and what alternatives would also have been possible. **(8 marks)**
4. (a) Explain the function of the `action` attribute of the `form` tag. **(2 marks)**

- (b) Provide the HTML code required to produce the form below. **(7 marks)**

Enter your name:	<input type="text"/>
Select your favourite sport:	<input type="radio"/> Football <input type="radio"/> Hurling <input type="radio"/> Soccer
What languages do you speak?	<input type="checkbox"/> English <input type="checkbox"/> Irish <input type="checkbox"/> French
<input type="button" value="Submit"/> <input type="button" value="Clear"/>	

- (c) If the form from part (b) above was submitted with the values as selected in the form below, explain precisely what data would be submitted, and how it would be represented. **(4 marks)**

Enter your name:	<input type="text" value="Charlie"/>
Select your favourite sport:	<input checked="" type="radio"/> Football <input type="radio"/> Hurling <input type="radio"/> Soccer
What languages do you speak?	<input checked="" type="checkbox"/> English <input checked="" type="checkbox"/> Irish <input type="checkbox"/> French
<input type="button" value="Submit"/> <input type="button" value="Clear"/>	

- (d) Provide a JavaScript function to ensure that the form in part (b) above has some input for each of its elements before it is submitted. Show the changes to the HTML necessary to integrate this function with the form. **(5 marks)**
- (e) JavaScript makes use of objects to a large degree. Discuss this, by explaining what objects are, and what objects JavaScript uses. Use code samples and examples to illustrate your answer. **(7 marks)**
5. (a) Using an example, show the various lines that form the HTTP1.1 request and response headers. List and explain three different values that the request line in the HTTP request can take. **(7 marks)**  
**(contd. overleaf)**

- (b) *Cookies* are exchanged between clients and servers in HTTP headers. Explain in detail what a cookie is and what it is used for. Give a sample application for cookies in web development. **(4 marks)**
- (c) Provide the JavaScript function that would be used to save the *name* and the *sport* from the form in Question 4(b) above into a cookie called *favouritesport*. Explain what is happening on each line in the code. **(7 marks)**
- (d) Give code to read in the cookie from Question 5 (c) above, and display each individual value stored in the cookie. Explain each line of code. **(7 marks)**
6. (a) Explain why it is important that your code can run in all browsers. What should you do to ensure your HTML code is compatible with all browsers (without using JavaScript)? **(4 marks)**
- (b) It is possible to use JavaScript to detect the type of browser being used by a client. Provide JavaScript code to do the following:
- (i) Detect the type of browser being used
  - (ii) Detect the version of browser being used
  - (iii) Redirect to `ie.html` if the type used is Microsoft Internet Explorer and the version is greater than 4
  - (iv) Redirect to `ns.html` if the type used is Netscape and the version is greater than 5
  - (v) Otherwise, if neither of the last two conditions are satisfied, redirect to `outofdate.html`
- (7 marks)**
- (c) Explain, compare and contrast all of the following markup languages.
- (i) SGML
  - (ii) HTML
  - (iii) XML
  - (iv) XHTML
- (6 marks)**
- (d) In terms of XML, explain what *DTD* and *Schema* are. Create the DTD that should be used with the XML document shown below. **(8 marks)**  
**(contd. overleaf)**

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22  </SUBJECT>
23 </COURSE>
24
```