

S228/204

DUBLIN INSTITUTE OF TECHNOLOGY
KEVIN STREET, DUBLIN 8.

BSc Computer Science

Year 2

SUMMER EXAMINATIONS 2006

WEB DEVELOPMENT

MR. C. O'LEARY
DR. B. O'SHEA
DR. K. BECHKOUM

TIME ALLOWED: 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) Provide the HTML code for the list below. (You do not need to provide code for the entire page.)

- ```
■ Ireland
■ England
■ Scotland
■ Wales
```

(2 marks)

- (ii) Provide the HTML code for the list below. (You do not need to provide code for the entire page.)

- ```
2002. Ireland
2003. England
2004.
      i. Ireland
      ii. England
2005. Wales
```

(3 marks)

- (b) (i) In relation to CSS, explain what is meant by a *class* and a *pseudoclass*.
(2 marks)

- (ii) Provide the CSS code that would implement the following formatting on <a> elements:

- Both anchors and links appear in size 12 courier font.
- Unvisited links have a background colour of yellow.
- When the mouse is placed over a link, it changes to bold.

(3 marks)

- (c) (i) Why, in your opinion, are frames useful in web pages?
(2 marks)

- (ii) What, in your opinion, are the disadvantages of using frames in web pages?
(3 marks)

- (d) Provide the additional code necessary so that the web page whose code is given in Figure 1 below produces the output shown in Figure 2. (Hint: you need to define Square and Rectangle classes, incorporating methods.)

```
<html>
  <head>
    <script language="javascript">

      // PUT ADDITIONAL CODE HERE

      function go() {
        var s = new Square(5);
        s.printArea();
        document.write("<br>");
        var r = new Rectangle(15, 25);
        r.printArea();
      }

    </script>
  </head>
  <body onload="go();" >
  </body>
</html>
```

Figure 1

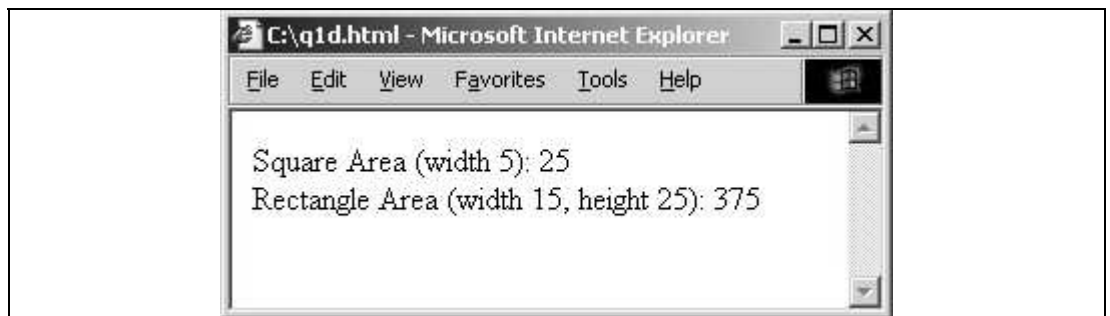


Figure 2

(5 marks)

- (e) (i) What output would you expect from the code below. Explain briefly.

```
<html>
  <head>
    <script language="javascript">

      document.write(window.history.current);
      document.write(window.history.next);
      document.write(window.history.previous);

    </script>
  </head>
  <body>
</body>
</html>
```

(3 marks)

- (ii) Popup windows are accepted as an annoying feature of many web pages. Show how it is possible to launch popup windows with messages using JavaScript.

(2 marks)

- (f) Consider the code shown below. Its purpose is to generate a number of paragraphs and then align the text in one of them to the *centre*. Complete the code for the two empty functions using DOM methods.

```
<html>
  <head>
    <script language="javascript">

      function addParagraph(contents) {
      }

      function alignToCentre(paragraphNumber) {
      }

      function go() {
        var p=prompt("How many paragraphs do you want?", 3);
        for(i = 0; i < p; i++)
          addParagraph("This is paragraph number " + (i+1));
        var q=prompt("Which one do you want to centre?", 1);
        alignToCentre(q - 1);
      }

    </script>
  </head>
  <body onload="go()">
</body>
</html>
```

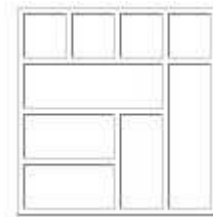
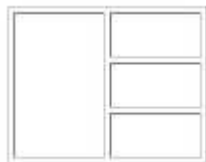
(5 marks)

Section B

Attempt any THREE Questions

2. (a) List and describe five key factors which you feel affect the usability of a website. **(6 marks)**
- (b) Accessibility is an issue of increasing importance in web design. Explain why this is the case, and provide a list of six coding issues web designers should consider when implementing accessible web sites. **(9 marks)**
- (c) Using any factors you consider important, provide a critique of any website that you have visited in the past. The critique should be constructed in such a way that it could be used by the website designer to improve the usability or accessibility of their website. **(10 marks)**
3. (a) Compare and contrast tables and layers as approaches to organising the layout of a web page. **(6 marks)**
- (b) Provide separately the HTML code necessary to produce the tables shown below using:
- Cellspanning.
 - Nested tables.

Present your opinion on the advantages and disadvantages of each approach.



- (9 marks)**
- (c) Provide the HTML code necessary to implement a layer which constantly changes its location to the location of the mouse. **(10 marks)**

4. (a) Using an example, describe the role of IP, TCP and HTTP in the standard web architecture.

(6 marks)

- (b) Consider the form shown below.

The screenshot shows a Microsoft Internet Explorer window displaying a web form. The form has two sections: 'Student Details' and 'Module Selections'. In the 'Student Details' section, there are two text input fields: 'Student Name' containing 'John Swan' and 'Student ID' containing 'C12345678'. The 'Module Selections' section contains three checkboxes: 'Object Oriented Programming' (checked), 'Microprocessors' (unchecked), and 'Web Development' (checked). Below the checkboxes is a 'Submit Query' button. The browser's status bar at the bottom shows 'Done' and 'My Computer'.

When the form is submitted, the query string is the one shown below.

```
stuname=John+Swan&stuid=C12345678&module=oop&module=wd
```

Provide the HTML code for the form, assuming it is submitted to `process.jsp` using HTTP POST.

Also, you should provide JavaScript code which would prevent the form from being submitted unless the following conditions hold:

- The name is provided.
- The student ID is in the correct format i.e. a letter followed by 8 numbers.
- At least one module is selected.

(9 marks)

- (c) Provide the additional code necessary to save the values that were entered into the form in part (b) above, so that when the browser is re-opened the previously entered *student name*, *student id* and module selections will be automatically displayed.

(10 marks)

5. (a) Using diagrams and examples, explain why Java is particularly suited to the World-Wide-Web, referring in particular to its suitability for mobile code. **(6 marks)**
- (b) The code below shows the shell of a Java applet. Provide the code for a web page that passes a text string as a parameter to this applet. Show how to modify the Java code below so that the text string is displayed in the applet.

```
import java.applet.Applet;
import java.awt.Graphics;
import java.awt.Color;

public class Q5B extends Applet {
    public void init() {
    }
    public void paint(Graphics g) {
    }
}
```

(9 marks)

- (c) Describe exactly the appearance and behaviour of the applet below when run in a browser.

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;

public class Q5C extends Applet {
    private final Label label = new Label("Paul Hewston says...");
    private final Button button1 = new Button("Begin");
    private final Button button2 = new Button("End");
    public void init () {
        setLayout(new BorderLayout());
        add(label, BorderLayout.NORTH);
        Panel panel = new Panel();
        add(panel, BorderLayout.SOUTH);
        panel.setLayout(new BorderLayout());
        panel.add(button1, BorderLayout.WEST);
        panel.add(button2, BorderLayout.EAST);
        button1.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                label.setText("Hello, hello...");
            }
        });
        button2.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                label.setText("...a place called Vertigo");
            }
        });
    }
}
```

(10 marks)

6. (a) Describe the relationship between HTML, XML and XHTML. **(6 marks)**
- (b) Using an example, show how XSL can be used to convert XML to XHTML. **(9 marks)**
- (c) Give a detailed discussion on your view of the future of the World-Wide-Web including the Semantic Web. **(10 marks)**