BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

PRINCIPLES OF INTERNET TECHNOLOGIES

Wednesday 2nd April 2014 - Morning
Answer **any** FOUR questions out of SIX. All questions carry equal marks.
Time: TWO hours.

Answer any Section A questions you attempt in Answer Book A
Answer any Section B questions you attempt in Answer Book B

The marks given in brackets are **indicative** of the weight given to each part of the question.

Calculators are **NOT** allowed in this examination.

Section A

Answer Section A questions in Answer Book A

A1. **a)** In relation to JavaScript, briefly state what each of the following terms refer to:

i) Variable
ii) Data type
iii) Operator
iv) Statement
v) Function

(**5 marks)**

b) Consider the following JavaScript code:

```
function exampleFunction {

  var f = document.forms["myForm"]["email"].value
  var atpos = f.indexOf(@);
  var dotpos = f.lastIndexOf(".");

  if (atpos < 1 , dotpos < atpos+2 , dotpos+2 >= f.length)
    alert("invalid entry");
    return false;

}
```

i) Identify EIGHT missing or incorrect characters in the code that will cause errors.

(8 marks)

ii) State the intended purpose of the code.

(**2 marks)**

c) In relation to JavaScript:

i) Write code for a JavaScript function that:

- takes two integers as parameters,
- sums all the numbers from the lowest of the parameters to the highest of the parameters. For example, if the parameters were 2 and 4 the result would be 9, that is 2+3+4=9),
- the function should then return the value of the result.

(6 marks)

ii) Write JavaScript code for the function call that calls the above function and passes it two numbers.

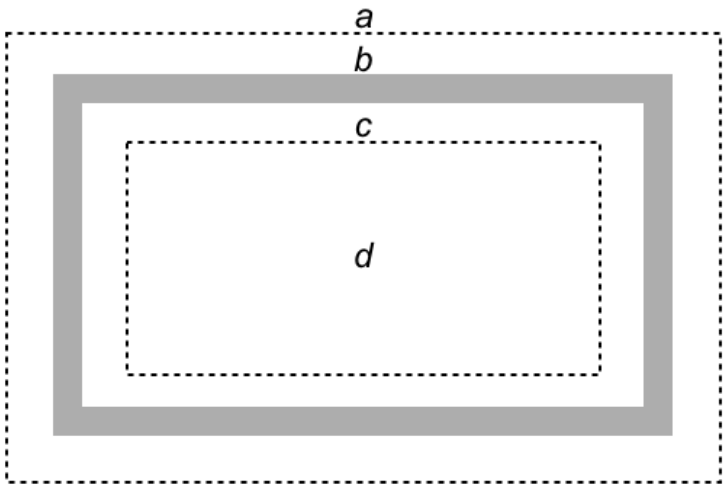
(**4 marks)**

A2. **a)** In relation to Cascading Style Sheets (CSS), briefly state what each of the following terms refer to:

i) Selector
ii) Property
iii) Value
iv) Id
v) Class

(**5 marks)**

b) In relation to Cascading Style Sheets, consider the diagram below:



Provide correct labels for the elements of the diagram annotated *a*, *b*, *c* and *d* and identify this model and state what is represents.

(**5 marks)**

Turn Over]

c) Consider the following CSS markup:

```
<style>

  body {
    width: 800px;
    text-align: left;
  }

  h1 {
    margin: 50px 50px 10px 50px;
    font-family: Helvetica, Arial, Sans-Serif;
    font-size: 16px;
    text-decoration:underline;
  }

  p {
    margin: 20px 50px;
    font-family: "Times New Roman", Georgia, Serif;
    font-size: 16px;
    text-indent: 50px;
    text-align: justify;
  }

  p.quote {
    margin: 0px 100px;
    font-family: "Courier New", Courier, monospace;
    font-size: 90%;
    text-indent: 0px;
    color: #2a2;
  }

</style>
```

i) Briefly state the purpose of each part of the above CSS and the effect each rule would have on any HTML it might be applied to.

(8 marks)

ii) Write HTML markup to demonstrate how each of the styles might be used.

(3 marks)

iii) Sketch how the HTML you have provided might be rendered in a browser, noting styles and spacing between elements on your diagram.

(4 marks)

A3. **a)** In relation to XML data modelling:

i) Model a *music* data source in XML:
- provide XML markup for the data source; and
- model the song *title*, *performer* and *duration* for each *song*; and
- provide XML markup for THREE example songs.

(**7 marks)**

ii) With reference to the XML markup you produced for a) i), what task might the following JavaScript statement perform and what data would it return:

```
getElementsByTagName("performer")[1].childNodes[1].nodeValue;
```

(**3 marks)**

b) In relation to the `XMLHTTPRequest`:

i) State what the `XMLHTTPRequest` stands for and briefly describe TWO examples of how it might be used in web authoring.

(**6 marks)**

ii) Identify and briefly describe THREE of the `XMLHTTPRequest` methods commonly supported by user agents that support the `XMLHTTPRequest` object.

(**9 marks)**

Section B

Answer Section B questions in Answer Book B

B4. **a)** State what each of the following stands for AND briefly explain its purpose:

i) TCP
ii) IP
iii) UPnP
iv) SMTP
v) DHCP

(10 marks)

b) Explain the main reason for the introduction of IPv6.

(3 marks)

c) What is the importance of NAT in the context of IPv4?

(3 marks)

d) Explain the difference between static and dynamic IP addresses and indicate when each is appropriate.

(4 marks)

e) Explain the role of DNS in the operation of the Internet.

(5 marks)

B5. **a)** What do the following terms stand for?

i) FTP
ii) NTP
iii) URL
iv) HTML
v) HTTPS
vi) RFC

(6 marks)

b) Define and briefly explain the role of:

i) IETF
ii) ISOC
iii) NRO
iv) W3C

(8 marks)

c) Explain what is meant by dynamic routing and static routing. Which of these applies to the Internet?

(5 marks)

d) Explain the role of a web crawler (spider).

(4 marks)

e) Explain why two different search engines may return different results when given the same search terms.

(2 marks)

B6. **a)** **i)** Explain, with the aid of an example, what is meant by client-server architecture.

(4 marks)

ii) State a protocol used in the context of the WWW and briefly outline its role.

(2 marks)

b) Explain, with the aid of an example, what is meant by peer-to-peer architecture.

(4 marks)

c) **i)** Explain the role of VDSL in broadband Internet access.

(5 marks)

ii) What is the main advantage of VDSL compared to ADSL?

(1 mark)

d) Outline TWO communication technologies which allow high-speed Internet access through mobile devices such as smart phones.

(4 marks)

e) Explain the ways in which Voice over IP (VoIP) and Video on Demand make different demands on the Internet infrastructure compared to conventional Internet applications such as email and web browsing.

(5 marks)