BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

PRINCIPLES OF INTERNET TECHNOLOGIES

Thursday 4th April 2013 - 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)** Briefly state what each of the following languages are normally used for in relation to Web development?

i) JavaScript
ii) PHP
iii) Java
iv) Ruby on Rails
v) XML

(**5 marks)**

b) In relation to placing JavaScript code in an HTML page:

i) State the HTML markup to include an external JavaScript file.
(3 marks)

ii) State TWO advantages of keeping JavaScript code in an external file.
(2 marks)

c) Consider the following JavaScript code:

```
var days = [Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday];
var today = new Date().getDay();

for (var i=1; i<7; i++) {
    if (i = today) {
        document.write("Today is "  days[today]  "<br>");
    }
    else {
        document.write("Today is not "  days[today]  "<br>" );
    }
}
```

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i) Identify FIVE types of errors in the code.
Note that each type of error may occur at more than one point in the code. This counts as a single error.

(5 marks)

ii) Explain the effect that each error would cause when the script is run.

(5 marks)

iii) Show what the corrected code would output.

(2 marks)

iv) Write JavaScript code to produce the following output:

```
Saturday
Friday
Thursday
Wednesday
Tuesday
Monday
Sunday
```

(3 marks)

A2. **a)** In relation to image file formats used on the Web:

i) Briefly describe what the term *vector image* refers to and state a common vector image file format.

(2 marks)

ii) Briefly describe what the term *bitmap image* refers to and state a common bitmap image file format.

(2 marks)

iii) Briefly state TWO advantages of vector images over bitmapped images for displaying images on the Web.

(2 marks)

iv) Why is the Adobe Flash .swf file format becoming a less appropriate way of presenting graphical content on the Web?

(2 marks)

v) State an image file format best suited to presenting photographic images on the Web.

(1 mark)

vi) State an image file format best suited to presenting non-photographic images on the Web.

(1 mark)

b) In relation to audio and video data on the Web:

i) Outline what is meant by the term *streaming*.

(1 mark)

ii) Explain how streaming differs from downloading a file, stating ONE advantage and ONE disadvantage of streaming compared to downloading a file.

(3 marks)

iii) Outline what is meant by the term *podcasting*. Identify a suitable file format to use in audio podcasting.

(2 marks)

Turn over]

c) In relation to syndicating Web content:

i) What does the term RSS mean and outline the role that RSS plays?
(2 marks)

ii) Identify 2 benefits that can be had from using RSS, either for the provider or the consumer.
(2 marks)

iii) What does the term XML mean and outline the role that it plays in relation to RSS?
(2 marks)

iv) What does the `<channel>` element specify in an RSS file?
(1 mark)

v) What does the `<item>` element specify in an RSS file?
(1 mark)

vi) What does the `<enclosure>` element specify in an RSS file?
(1 mark)

A3. **a)** What does CSS mean and what is the purpose of CSS?
(2 marks)

b) Name each of the 4 required parts of a CSS rule and very briefly state the purpose of each part.
(4 marks)

c) In relation to inserting CSS rules into an HTML file:

i) Identify the THREE ways in which CSS rules can be inserted.
(3 marks)

ii) State which is the preferred approach and why this is the case.
(2 marks)

d) Consider the following CSS markup:

```
<style>
  body
  {
    width: 400px;
    text-align: left;
  }
  h1
  {
    font-family: Helvetica, Arial, Sans-Serif;
    font-size: 16px;
    margin: 20px 10px 5px 10px
  }
  p
  {
    font-family: "Times New Roman", Georgia, Serif;
    font-size: 14px;
    margin: 10px 10px 20px 10px;
  }
</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.

(7 marks)

ii) Write a declaration for the `body` rule to set its background colour to white.

(1 mark)

iii) Write a declaration for the `h1` rule to set its text colour to `#226622`.

(1 mark)

iv) Write a declaration for the `p` rule to flush justify paragraph text.

(2 marks)

v) Write a CSS id selector called `firstParagraph` that reduces the top margin of a paragraph to 0px.

(2 marks)

vi) Write an HTML `p` tag that makes use of the id selector from part v) above.

(1 mark)

Section B

Answer Section B questions in Answer Book B

B4. **a)** Expand each of the following:

i) TCP
ii) IP
iii) NAT
iv) DNS
v) URL

(5 marks)

b) Write down an example of an IPv4 address. By using this example and considering the binary equivalent or otherwise, calculate the total number of distinct addresses possible under IPv4 addressing.

(4 marks)

c) Explain the role of ports in port-based (overloaded) NAT.

(3 marks)

d) What is the importance of NAT in the context of IPv4 addressing?

(3 marks)

e) Give an outline of the structure of DNS and explain briefly how it operates.

(5 marks)

f) Write down an example of an URL and explain its individual parts.

(5 marks)

B5. **a)** What do the following terms stand for and what is the purpose of each?

i) ADSL
ii) BBS
iii) DHCP
iv) IRC
v) MIME
vi) RFC

(12 marks)

b) Define and briefly explain the role of:

i) IANA
ii) ISOC
iii) IAB
iv) W3C

(8 marks)

c) Explain what is meant by:

i) a packet switched network; and
ii) a circuit switched network.

Which of these applies to the Internet?

(5 marks)

Turn over]

B6. **a)** **i)** What is Web accessibility as defined by the W3C?

(2 marks)

ii) Why is Web accessibility important?

(2 marks)

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

(4 marks)

c) State TWO protocols used in the context of email and briefly outline their roles.

(4 marks)

d) **i)** Explain the role of ADSL in broadband Internet access.

(5 marks)

ii) What is “the local loop”?

(2 marks)

iii) What is local loop unbundling?

(2 marks)

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

(4 marks)