BCS THE CHARTERED INSTITUTE FOR IT

BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

PRINCIPLES OF INTERNET TECHNOLOGIES

Wednesday 27th March 2019 - 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) Strict Mode.
ii) Debugging.
iii) Scope.
iv) Literals.
v) Client-side.

(5 marks)

b) Given the following HTML code:

```
<body>
<form name="myform" method="post" action="" onsubmit="checkform();">
Name: <input type="text" name="name"><br/>
Password: <input type="password" name="password"><br/>
<input type="submit" value="Enter">
</form>
</body>
</html>
```

write a JavaScript function `checkform()` that will test for the following conditions:

i) Check to see if the name field has a value.
ii) Check to see if the password field has a value.
iii) Check to see if the name entered is *testname* and the password is *testpass*.

If the three conditions have been met, then the user should be informed that the name and password are correct. Appropriate error messages should be used if conditions have not been met.

(15 marks)

c) State **THREE** advantages and **TWO** disadvantages of using JavaScript.

(5 marks)

A2. **a)** In relation to Web authoring, expand the following terms, where appropriate and describe the role they play:

i) PHP.
ii) SQL.
iii) Server.
iv) Accessibility.
v) jQuery.

(5 marks)

b) i) What is 'responsive' web design? **(4 marks)**

ii) State **THREE** benefits of using 'responsive' web design. **(6 marks)**

c) State **TWO** main differences between static and dynamic webpages.

(4 marks)

d) Using only a labelled diagram, illustrate the architecture of a web application, showing the relationship between the client side and the server side.

(6 marks)

A3. **a)** State **TWO** differences between XML and HTML. **(4 marks)**

b) Why might a web developer prefer to use JSON instead of XML?

(6 marks)

c) In relation to XML data modelling:

- Model a data source intended for a *shop*: and
- Model the *brand, supplier,* and *price* for the details of each *item* that is to be held in the *shop* system and
- Provide XML mark-up for an item.

(10 marks)

d) i) What is XMLHttpRequest? **(2 marks)**

ii) How does XMLHttpRequest allow for a user-friendly experience on a webpage?

(3 marks)

Section B
Answer Section B questions in Answer Book B

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

i) UDP.
ii) IMAP.
iii) DNS.
iv) IP.
v) ARP.
vi) ICMP.

(6 marks)

b) Map the previous six protocols found in part a) to the layers of the TCP/IP model.

(6 marks)

c) TCP is described as a 'connection-oriented' protocol.

i) Expand the acronym 'TCP' **(1 mark)**

ii) What is meant by the term 'connection-oriented' in reference to TCP? **(2 marks)**

iii) Provide TWO applications that utilise TCP and briefly explain why they benefit from using TCP.

(4 marks)

d) Draw a labelled diagram illustrating the role of DNS. **(6 marks)**

B5. **a)** What is the purpose of **robots.txt** and briefly explain why some website administrators decide to use it?

(4 marks)

b) Explain the role of a **web crawler** (also known as a 'spider'). **(4 marks)**

c) Explain the role of a **web scraper** and provide **TWO** examples where a web scraper may be useful.

(4 marks)

d) What is meant by the term 'web accessibility' and why is web accessibility important?

(3 marks)

e) i) Expand the acronym 'DHCP'. **(2 marks)**

ii) Using a suitably labelled diagram, illustrate how DHCP works.

(6 marks)

f) What is a 'static IP address' and when may a network administrator choose to use one?

(2 marks)

B6. **a)** With the use of a suitable example, expand and explain each of the following.

i) QR Codes.
ii) RFID.
iii) GPS.

(9 marks)

b) Discuss the advantages and limitations of an 'always-connected' (that is, always online) society. In your answer, you may wish to discuss privacy concerns surrounding ubiquitous computing.

(4 marks)

c) Given the following **THREE** wireless technologies, briefly explain their function and an appropriate usage of each.

i) Bluetooth.
ii) ZigBee.
iii) IEEE 802.11 standard (also known as "Wi-Fi").

(9 marks)

d) Briefly explain how a network administrator can secure a Wi-Fi network.

(3 marks)

END OF EXAMINATION PAPER