

BCS THE CHARTERED INSTITUTE FOR IT
BCS HIGHER EDUCATION QUALIFICATIONS
BCS Level 5 Diploma in IT

PRINCIPLES OF INTERNET TECHNOLOGIES

Wednesday 30th March 2016 - 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 refers to:

- i) Array
- ii) Boolean
- iii) Event
- iv) Keyword
- v) Script

(5 marks)

b) Consider the following JavaScript code and identify 5 errors:

```
<script type = "text/javascript"  
var firstName = John;  
var lastName = "Smith"  
var fullName = firstName + " "lastName;  
document.write("My name is "+fullname);  
</script>
```

(5 marks)

c) In relation to JavaScript:

i) Write code for a JavaScript function that:

- reads in two numbers from an HTML form
- determines which number is the largest
- outputs to screen which number is the largest (in the format *44 is larger than 22*)

(10 marks)

ii) Write an appropriate HTML form which will call this function.

(5 marks)

A2.

- a) What are the three types of CSS? **(6 marks)**
- b) What type of CSS is recommended when designing websites? Justify your choice. **(4 marks)**
- c) Write a CSS rule that would change the font in all paragraph elements to Arial and the colour of the font to red. **(6 marks)**
- d) i) Write a CSS rule for an ID selector that would define the font to be italic and position the text to the right. **(6 marks)**
ii) Write a declaration for this rule to show how it can be applied to a particular header element. **(3 marks)**

A3.

- a) In relation to XML data modelling:
 - i) expand the acronym XML
 - ii) model a *university* data source: and
 - iii) model the *name*, *address*, and *course* for each *student* and
 - iv) provide XML mark-up for a student**(8 marks)**
- b) State what AJAX is. Provide two advantages of using AJAX on a web page. **(9 marks)**
- c) Identify and briefly describe the two XMLHttpRequest methods that will relay a request to a server. **(8 marks)**

Section B
Answer Section B questions in Answer Book B

B4.

- a) Expand each of the following acronyms:
 - i) TCP
 - ii) UDP
 - iii) HTTP
 - iv) ICMP
 - v) ARP
 - vi) DNS**(6 marks)**
- b) Map the previous six protocols found in part a) to the TCP/IP model. **(6 marks)**
- c) Comparing and contrasting their similarities and their differences, describe the main features of TCP and UDP. **(6 marks)**
- d) HTTP is described as a stateless protocol. In this context, define what stateless means and provide THREE examples of how a web application maintains state given that HTTP is stateless. **(4 marks)**
- e) Briefly explain the role of DNS and its supporting role in the operation of the Internet. **(3 marks)**

B5.

a) Expand each of the following acronyms and briefly explain their purpose:

- i) IP
- ii) FTP
- iii) SSH
- iv) DHCP
- v) NAT

(10 marks)

b) Write an example of an IPv4 address, then go on to describe how many distinct addresses there can be when using the IPv4 address space.

(3 marks)

c) Explain the importance of NAT in the context of IPv4 addressing

(3 marks)

d) Provide FOUR advantages of IPv6 over IPv4.

(4 marks)

e) Explain what is meant by:

- i) a packet switched network
- ii) a circuit switched network

Which of these applies to the Internet?

(5 marks)

B6.

a) Expand the following in the context of a mobile/cell phone operation:

- i) EDGE
- ii) GSM
- iii) HSPA
- iv) 4G
- v) WAP

(5 marks)

b) From a security perspective, why do network administrators prefer to use managed switches over hubs for their computer networks? In your answer, provide a brief explanation on how hubs and switches work.

(4 marks)

c) i) Identify THREE threats a company can face against their computer network from an external attacker.

(3 marks)

ii) How can a company protect themselves from the threats you identified in part c) i)?

(3 marks)

d) i) Explain the role of a web scraper.

(1 mark)

ii) Provide TWO examples where using a web scraper may be useful.

(2 marks)

iii) What issues, legal and ethical, may arise when using web scraping software?

(3 marks)

e) i) In computer networks, define what is meant by a 'proxy server'?

(1 mark)

ii) Provide THREE benefits of using a proxy server.

(3 marks)