

# THE BRITISH COMPUTER SOCIETY

## THE BCS PROFESSIONAL EXAMINATIONS BCS Level 5 Diploma in IT

### PRINCIPLES OF INTERNET TECHNOLOGIES

23<sup>rd</sup> April 2008, 10.00 a.m.-12.00 p.m.

Answer FOUR questions out of SIX. All questions carry equal marks.

Time: TWO hours.

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

Calculators are <b>NOT</b> allowed in this examination.
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1. a) Explain the meaning of the term *blog* (weblog) by describing its typical features.  

**(5 marks)**
  - b) Define the terms RSS and ATOM and explain how they could be used to enrich a blog.  

**(5 marks)**
  - c) Voice over IP (VoIP) and Video on Demand (VoD) are relatively new applications running over the Internet. Explain the ways in which the demands they make of the technology differ from more conventional Internet applications such as email and web browsing.  

**(5 marks)**
  - d) You have been asked to advise your community about setting up an Internet discussion forum. Local people would be able to use it to comment on the community services and make suggestions for improvements.  

What advice would you give concerning:

    - i) ethical, moral and legal issues;
    - ii) access to the forum; and
    - iii) technical resources to set up the forum?

**(10 marks)**
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2. a) i) Define the term web *portal* and give an example.  

**(2 marks)**
  - ii) Outline the main characteristics of a portal.  

**(2 marks)**
  - iii) State **two** application areas for portals.  

**(2 marks)**

**Turn over]**

- b) i) Outline the challenges faced by companies such as Google™ in ensuring that their search engines are effective. **(5 marks)**
- ii) Explain the role of a web crawler (spider). **(4 marks)**
- iii) State **three** types of information that might be indexed. **(3 marks)**
- iv) Explain why two different search engines may return different results when given the same search terms. **(2 marks)**
- c) i) Define the term *online database*. **(2 marks)**
- ii) State **three** things that should be considered when setting up an online database. **(3 marks)**
3. a) <http://www.bcs.org.uk/index.html> is a typical URL. Define the acronym URL and explain the significance of the various elements in this example. **(5 marks)**
- b) i) Why are IP addresses central to the functioning of the Internet? **(2 marks)**
- ii) Explain the difference between static and dynamic IP addresses and indicate when each is appropriate. **(4 marks)**
- iii) *Network Address Translation* (NAT) is one solution to the shortage of IP addresses. Explain when it can be used and how it addresses the problem. **(4 marks)**
- iv) State another solution to the shortage of IP addresses and briefly explain how it addresses the problem. **(2 marks)**
- c) i) Explain how the *Domain Name System* (DNS) allows computers to contact each other to exchange email or display web pages. **(5 marks)**
- ii) Give **three** reasons for DNS errors. **(3 marks)**

4. a) i) Give **three** examples of the use of the client-server protocols on the Internet.  
**(6 marks)**
- ii) Give **three** methods of making an Internet connection and for each method state when it would be appropriate and when it would be inappropriate.  
**(9 marks)**
- b) i) Electronic mail (e-mail) relies on a number of protocols to facilitate the sending, transfer and receiving of mail. State three such protocols and briefly describe their role.  
**(6 marks)**
- ii) How does Webmail differ in the protocols that it uses?  
**(2 marks)**
- iii) Why is the practise of operating an open mail relay frowned upon?  
**(2 marks)**
5. a) What do the following terms stand for:  
XML  
AJAX  
DTD  
XHTML  
**(8 marks)**
- b) What is the relationship between XHTML and HTML and what constraints do XHTML tags have?  
**(4 marks)**
- c) What is XSLT used for in conjunction with XML?  
**(4 marks)**
- d) Give a brief description of the purpose of each of the following XSLT elements:
- i) <xsl:stylesheet>  
ii) <xsl:value-of>  
iii) <xsl:for-each>  
**(9 marks)**

6. a) State **three** benefits of including dynamic content in a website. **(3 marks)**  
*(Hint: Keep each listed benefit to a short sentence or point.)*
- b) Describe the benefits of including a scripting language on the client's browser. **(3 marks)**
- c) Describe the drawbacks in relying on client-side scripting. **(3 marks)**
- d) Embed JavaScript in an HTML page to generate the following output:

£(1)	\$(1.6)	\$	£
250	400	250	156.25
260	416	260	162.5
270	432	270	168.75
280	448	280	175
290	464	290	181.25
300	480	300	187.5
310	496	310	193.75
320	512	320	200
330	528	330	206.25
340	544	340	212.5
350	560	350	218.75
360	576	360	225
370	592	370	231.25
380	608	380	237.5
390	624	390	243.75
400	640	400	250

**(10 marks)**

- e) Write a JavaScript function called **convertcase()** as part of a basic HTML page to accept one input value and convert the text to uppercase. The input text should be read from an input text box and the output displayed in another text box. Here is an example of the screen after the button has been pressed:

Input:

Output:

Convert to upper case

*(Hint: Make use of JavaScript method **toUpperCase()** within your function.)*

**(6 marks)**