THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATIONS
Diploma

THE INTERNET & THE WORLD WIDE WEB

2nd May 2006, 2.30 p.m.-4.30 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.*

1. You are to consider yourself as acting as a consultant to two companies seeking your advice on Web development. The only difference between the companies is the stage they are at in terms of Web presence.

    The first company 'Beginners World' has no Web presence and is seeking your advice on how to start to have a presence on the Web. The second company 'Advanced World' has had a Web presence for 3 years and is starting to rely on Web customers to extend their market share across the world.

    a) Describe what advice you would give to each company with regard to investment in their Web presence.
    (15 marks)

    b) For each of the companies, outline the website design approaches that would make each site as usable and maintainable as possible. **(10 marks)**

2. *a)* Explain the security risks that a home user faces when moving from a dial up to ADSL broadband Internet connection. Include in your answer suitable measures that can be taken to address these risks.   **(10 marks)**

    b) What are the additional risks presented by wireless home networks and how can these be addressed?
    (5 marks)

    c) List the typical factors that affect the performance of an ADSL broadband Internet connection.   **(5 marks)**

    d) Many users assume that they are anonymous when using the Internet. How valid is this assumption?
    (5 marks)

3. *a)* *i)* Describe the octet format of the Internet Protocol (IP) addresses.   **(4 marks)**

    ii) Explain the use of class divisions for a two-level hierarchy.   **(3 marks)**

    iii) What is the benefit of using a three-level hierarchy?   **(4 marks)**

    iv) Derive the number of networks and hosts that each of the classes can support.   **(6 marks)**
    [You may leave your answer as a power of 2.]

    b) What are the advantages and disadvantages of using fixed and dynamic IP addressing?   **(8 marks)**

4. *a)* Explain the role and architecture of the Domain Name System (DNS) in the operation of the Internet.

(7 marks)

b) List FIVE typical reasons why users experience DNS errors. **(5 marks)**

c) Building on, but not repeating your answer to (a), explain how the HTTP protocol facilitates the stages between a user requesting and receiving a web page. **(8 marks)**

d) What are the main differences between HTTP and HTTPS? **(5 marks)**

5. *a)* What do the acronyms POP3, IMAP and SMTP stand for? **(6 marks)**

b) With reference to the acronyms in *a)*, describe the stages between the creation of an email by the sender to it being read by the receiver. **(10 marks)**

c) From a user perspective, compare and contrast IMAP and POP3. **(5 marks)**

d) Explain the principal features of webmail systems such as 'Hotmail'. **(4 marks)**

6. *a)* *i)* Differentiate between bitmap and vector graphics. **(6 marks)**

ii) Select TWO still and TWO motion file formats used on the Web and identify their attributes in relation to bitmap and vector formats. **(8 marks)**

b) *i)* Describe the trade-off between compression and quality for images. **(4 marks)**

ii) If you have a 56Kbps modem, calculate how long will it take to download an uncompressed 10 second video clip, under optimal conditions, if the video is 15 frames per second (fps) and resolution of 160 x 120 pixels in 256 colours? *[Candidates must show their working.]* **(4 marks)**

iii) Explain why you are unlikely to achieve this performance in practice. **(3 marks)**