THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Diploma

COMPUTER NETWORKS

14th October 2003, 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.*

1. *a)* Explain, with the aid of appropriate diagrams, what is meant by:
    i)   Frequency modulation
    ii) Amplitude modulation
    iii) Phase modulation   **(6 marks)**

    b) Define the term *baud rate*.   **(2 marks)**

    c) Explain how available bandwidth and the signal to noise ratio for a particular transmission medium affects the maximum transmission speed.   **(8 marks)**

    d) Show, with the aid of appropriate diagrams, how the bit pattern "10011" can be encoded using:
    i)   Manchester encoding
    ii) Differential Manchester encoding.

    What are the advantages of using Manchester encoding?   **(9 marks)**

2. *a)* What actions would you take if an installed LAN reached its capacity?   **(8 marks)**

    b) Why might Ethernet be a better proposition than a Token Ring for a network carrying low traffic loads?
                                                                          (8 marks)
    c) A particular router has a MTBF of 12000 hours and a MTTR of 10 hours. What is its availability?**(3 marks)**

    d) How can the reliability of any network configuration be improved?   **(6 marks)**

3. *a)* What are the seven layers of the OSI reference model? Give a brief description of the functionality provided by each layer.   **(7 marks)**

    b) Explain the differences between UDP and TCP.   **(10 marks)**

    c) You are responsible for designing a network application that runs in a TCP/UDP/IP environment.
    i)   Under what circumstances might you choose to use TCP?
    ii) Under what circumstances might you choose to use UDP?   **(8 marks)**

4. *a)*   What are the main reasons for developing a network Disaster Recovery Plan? **(6 marks)**

b)   What techniques are used within a network Disaster Recovery Plan? **(8 marks)**

c)   What steps are required to set up a network Disaster Recovery Plan? **(5 marks)**

d)   What are the major threats to network operation? **(6 marks)**

5.   The development, implementation and operation of data networks is dependent on agreed standards.

a)   Why is there a need for standards? **(4 marks)**

b)   What are the advantages of standards? **(6 marks)**

c)   What are the disadvantages of standards? **(4 marks)**

d)   What is DSL? **(4 marks)**

e)   What is ADSL? **(3 marks)**

f)   What is ISDN? **(4 marks)**

6. *a)*   What is Network Capacity Planning? **(10 marks)**

b)   What are the benefits of Network Capacity Planning? **(10 marks)**

c)   What are the major components of Network Capacity Planning? **(5 marks)**