THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION
Professional Graduate Diploma

KNOWLEDGE BASED SYSTEMS

15th May 2003, 10.00 a.m.-1.00 p.m.
Answer THREE questions out of FIVE. All questions carry equal marks.
Time: THREE hours.

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

1. Discuss two commercial areas where artificial intelligence techniques are currently being used successfully to improve business performance. Your answer should include a description of the techniques being used, and a discussion of how they improve performance.   **(25 marks)**

2. Outline the main components of Natural Language Processing (NLP).   **(10 marks)**

    Stating any assumptions made, discuss how NLP could be used to:
    *   Gain an understanding of the relationships between electronic documents contained within a library
                                                                                         (5 marks)
    *   Automatically archive electronic documents   **(5 marks)**
    *   Translate Language   **(5 marks)**

3. Outline the mechanism by which rule induction works. How does this mechanism differ from a decision tree?
                                                                                         (15 marks)

    Identify and describe an algorithm for converting a decision tree into a set of rules.   **(10 marks)**

4. *a)*   What are the requirements of a learning system?   **(5 marks)**

    b)   Describe the generic principles behind the machine learning process.   **(10 marks)**

    c)   Explain with reasons why machine learning is important in building expert systems.   **(4 marks)**

    d)   Describe TWO major categories of learning algorithms with their advantages and disadvantages. **(6 marks)**

5. You have been asked to advise a company on how to develop and manage an expert system.

    a)   Produce a checklist of TEN items for planning and managing the development.   **(10 marks)**

    b)   Produce a checklist of TEN items on the selection of domain.   **(10 marks)**

    c)   Explain how you would evaluate the success of the expert system.   **(5 marks)**