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The British Computer Society
1 Sanford Street
Swindon
Wiltshire
United Kingdom
SN1 1HJ

THE BRITISH COMPUTER SOCIETY

THE BCS PROFESSIONAL EXAMINATION Advanced Diploma

KNOWLEDGE BASED SYSTEMS

19th April 2000 - 10:00a.m. – 1:00p.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. a) With respect to the following three knowledge representation models: semantic nets, production rules and frames:
 - i) explain the concept underlying the model; **(8 marks)**
 - ii) give an example of the use of the model. **(4 marks)**
- b) With examples, suggest three differences or similarities among the three models above. **(8 marks)**
- c) Propose, with explanation, a representation model that can combine all features of the three models above. **(5 marks)**

2. a) Explain, with suitable examples, the reasoning concepts of forward and backward chaining. **(9 marks)**
- b) Suggest how the combination of both forward and backward chaining can be applied in a practical situation. **(3 marks)**
- c) Describe, with suitable examples, three heuristic search techniques. **(13 marks)**

3. Give detailed descriptions of the knowledge based techniques necessary to construct a robot capable of navigating inside a building. **(25 marks)**

4. Give a definition of the term *data mining*. Describe two techniques from the field of AI that could be used as part of a data mining capability within a company. Your answer should include appropriate examples. **(25 marks)**

5. Discuss the problems of designing a knowledge based system. Describe a design methodology which claims to assist in the process of building knowledge based systems. **(25 marks)**