UNIVERSITY OF EDINBURGH

FACULTY OF SCIENCE AND ENGINEERING

# ARTIFICIAL INTELLIGENCE 2Ah SAMPLE MCQ QUESTIONS

May 2002

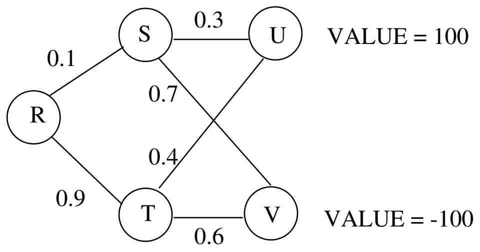
**There are 10 sample multiple choice questions in this paper. The AI2Ah exam in June 2002 will have 30 multiple choice questions (part A) plus two further parts B and C. The 30 multiple choice questions on the June paper will be worth 50% of the total mark of the AI2Ah paper.**

**Part A**
**ANSWER ALL QUESTIONS IN PART A. Use the special mark sheet.**

1. Most precisely, the Viterbi algorithm is an algorithm for:

   (a) Probabilistic speech part labeling
   (b) Searching graphical networks efficiently
   (c) Using Hidden Markov Models for classification

2. Given this diagram of states (R,S,T,U,V) labeled by the probability of transition between states (numbers on arcs). What is the expected utility of state R?




   (a) 40
   (b) 3
   (c) 0
   (d) -22
   (e) -54

3. Which of these is NOT an exhaustive search method?

   (a) A*
   (b) Breadth first search
   (c) Depth first search
   (d) Hill climbing
   (e) Uniform cost

4. Which of these statements is FALSE?

   (a) An optimal search strategy finds the solution as quickly as possible.
   (b) A complete search strategy is guaranteed to find a solution if there is one.
   (c) A low time complexity search strategy investigates as few states as possible.
   (d) A low space complexity search strategy has to remember as little as possible.

5. Which of these algorithms can go from a superior to an inferior solution

   (a) GSAT
   (b) Hill climbing
   (c) Simulated Annealing
   (d) Stochastic hillclimbing

6. Some strategies in resolution proofs place constraints on what clauses can participate in a proof. The result may mean that resolution is *incomplete*, and an otherwise provable goal cannot be proved. **Which** of the following strategies may have this effect on resolution?

   (a) input resolution
   (b) unit resolution
   (c) set of support

7. The fact that, depending on context, the string of symbols "I 0" can be interpreted as an instance of the number 10 or an reference to a moon of Jupitor, is an example of the problem of

   (a) redundancy
   (b) synonymy
   (c) ambiguity
   (d) similarity

8. **Where** does the language $a^n b^n c^n$ fit within the Chomsky Hierarchy?

   (a) Finite State (FS) Language
   (b) Context Free (CF) Language
   (c) FS language and CF language
   (d) Context Sensitive (CS) Language

9. If all we know about grammars G1 and G2 is that G1 generates the same set of strings as G2, we can at least say that

   (a) G1 is weakly adequate for the language generated by G2.
   (b) G1 is weakly equivalent to G2.
   (c) G1 is strongly adequate for the language generated by G2.
   (d) G1 is strongly equivalent to G2.

10. Which is **not** an operation used by the Earley algorithm?

   (a) complete
   (b) insert
   (c) predict
   (d) scan

# Specimen Answers

1. B
2. D
3. D
4. A
5. C
6. b
7. c
8. d
9. b
10. b