SOLUTION NOTES

Artificial Intelligence (Part II) 2001 Paper 8 Question 8 (WFC)

This question invites the candidate to handle a number of issues in artificial intelligence, and to synthesise an essay by combining a variety of topics covered in the course. A yes-or-no answer is not appropriate. A complete script should do the following:

1. Break out the questions and conditions implicit in the question, and restrict the discussion to a manageable number of these. For example,

    a. Is there a computer now that can think?

    b. Can an appropriately programmed computer think?

    c. Is it/will it be possible to program a computer appropriately?

    d. Is there a model of thinking?

    e. Can definitions of thinking be restricted (logical deductive reasoning *versus* "hunches" *versus* "behaviour that if a person did it we could call it thinking")?

2. Handle the breakouts in a systematic way. For example, use the 2D matrix in the notes that classifies definitions on a acts-thinks axis *versus* a person-machine axis.

3. The paradox of why is it hard to implement things that people find easy to do, while easy to implement things that people find hard to do.

4. Use historical connections. For example

    a. The Turing Test. Also note that Turing assumed the Test would be doable by now. Also, Turing considered the question "can a machine think" too meaningless to deserve discussion! By today's standard this would be considered an intellectually isolated and disengaged position.

    b. Searles' Chinese Room.

    c. Simon's Ant, and the flying bird metaphor.

5. The use of microworlds and games to restrict that possible environment and actions, and whether anything can be gained from that.

6. Thinking as simply abstract problem solving (easy to implement), or whether a framework for reasoning should include inductive, analogic, non-"rational" modes.

7. The role of learning, and whether learning is a kind of inbuilt mechanical problem solving, or depends on a capacity for social interaction (to learn by doing, learn by being shown how).