IITJ, B.Tech 3rd year(CSE), II semester
First Mid-Sem. Examination-2014
32002: Artificial Intelligence

Duration: 1 Hour   M.M. 20

1. For each pair of atomic sentences, give the most general unifier if it exists: (6)

   (a) $Q(y, G(A, B))$ and $Q(G(x, x), y)$

   (b) $knows(Father(y), y)$ and $knows(x, x)$

   (c) $\{f(x, g(x)) = y, h(y) = h(v), v = f(g(z), w)\}$

2. Give resolution proof for the inconsistency $\forall_x [shaves(Barber, x) \rightarrow \neg shaves(x, x)]$, where *Barber* is a constant.   (3)

3. Given the following knowledge-base: (5)

    If x is on top of y then y supports x.

    If x is above y and they are touching each other then x is on top of y.

    A phone is above a book.

    A phone is touching a book.

   Translate the above knowledge-base into clause form, and use resolution to show that the predicate "supports(book, phone)" is true.

4. It is required to construct an inferencing system for question answering. The answer of each question lies with in the boundaries of a single sentence in the collection of large text accessible to the inference system. Propose a strategy as how you will build the system. You may use one or more of the techniques studied including, conversion to predicate, conversion to clause form, resolution, forward-chaining, etc.

   You need to suggest the steps, indicating major operations by blocks and flow-control, and an algorithm, as well as a descriptive justification of the system. Assume that domain of the knowledge-base is limited to historical and tourism. Or it may be related to scientific discoveries. In the first, questions may be like, "what is capital of India'?", "where Taj Mahal is located?", and in the second case "who discovered telescope?", "Where experiment for god particle took place?", etc. Answer is given in single word.   (6)