Model Paper AI

Q1 is compulsory. Attempt any 3 rest of questions.

1. Attempt any 3 question.
    a. What are the ways of searching? Explain with algorithm.
        i. *Blind Search*
            1. *Breadth First Search*
            2. *Depth first search*
            3. *Iterative deepen DFS*
        ii. *Heuristic Search*
            1. *A**
            2. *AO**
            3. *Hill Climbing etc.*
    b. What is script? Explain the component of Script.
        i. **Scripts**: *A Script is a structure that prescribe a set of circumstances which could be expected to follow on from one to another.*
        ii. **Components**:
            1. *Entry Condition*
            2. *Results*
            3. *Props*
            4. *Roles*
            5. *Track*
            6. *Scenes*
    c. What is Expert System? Explain with example.
        i. *An Expert system is a set of program that manipulate requires human expertise encoded knowledge to solve problems that requires human expertise.*
            1. *Specialist*
            2. *Texts*
            3. *Journal Articles*
            4. *Databases*
            5. *Use*
                a. *Medicine*
                b. *System Configuration*
                c. *Engineering design*
    d. What is inferential Knowledge? Explain with an example.
        i. Inferential knowledge as formal logic:
        ii. Represent knowledge as formal logic:
2. Discuss and apply means end analysis to solve the monkeys and bananas problem.
    a. A monkey is in a room containing a box and a bunch of banas. The bananas are hanging from the ceiling out of the reach of the monkey. What sequence of actions will allow the money to get the banans?
        i. Monkey knows how to...
            1. Move around
            2. carry other things
            3. Reach the banans
            4. Wave the stick in the air.

3.
   a. GA using mutation procedure of 32-bit word that have first 16 bits 0s and last 16-bits 1s step by step procedure of backward chaining.
      i. Start with the goal.
      ii. Goal may be in WM initially, so check and you are done if found!
      iii. If not, then search for goal in the THEN part of the rules (match conclusions, rather than premises). This type of rule is called goal rule.
      iv. Check to see if the goal rule's premises are listed in the working memory.
      v. Premises not listed become sub-goals to prove.
      vi. Process continues in a recursive fashion until a premise is found that is not supported by a rule, i.e. a premise is called a primitive, if it cannot be concluded by any rule
      vii. When a primitive is found, ask user for information about it.
      viii. Back track and use this information to prove sub-goals and subsequently the goal.
   b. how knowledge representation and reasoning is closely coupled and independent too in AI cycle
      i. Knowledge representation (KR) and reasoning are closely coupled components; each is intrinsically tied to the other. A representation scheme is not meaningful on its own; it must be useful and helpful in achieve certain tasks. The same information may be represented in many different ways, depending on how you want to use that information. For example, in mathematics, if we want to solve problems about ratios, we would most likely use algebra, but we could also use simple hand drawn symbols. To say half of something, you could use 0.5x or you could draw a picture of the object with half of it colored differently. Both would convey the same information but the former is more compact and useful in complex scenarios where you want to perform reasoning on the information. It is important at this point to understand how knowledge representation and reasoning are interdependent components, and as AI system designer, you have to consider this relationship when coming up with any solution.
4. structure of Expert system explain the analogy with the real world example
   a. Having discussed the scenarios and applications in which expert systems may be useful, let us delve into the structure of expert systems. To facilitate this, we use the analogy of an expert (say a doctor) solving a problem. The expert has the following:
      i. Focused area of expertise
      ii. Specialized Knowledge (Long-term Memory, LTM)
      iii. Case facts (Short-term Memory, STM)
      iv. Reasons with these to form new knowledge
      v. Solves the given problem