(3 Hours)   **Total Marks: 80**

1) Q.1 is compulsory

2) Attempt any **three** from remaining **five** questions

Q1) Solve **any four** of the following:

   a) Describe different types of environment of AI agents   **[5]**
   b) What do you mean by Total Turing test. Explain.   **[5]**
   c) Explain Utility based Agent with a block diagram   **[5]**
   d) Formulate the 8 puzzle problem   **[5]**
   e) Describe the characteristics of a part picking robot using the PEAS properties **[5]**

Q2) a) What do you understand by Min Max Search and alpha beta search? Explain in detail with example.   **[10]**
   b) What do you understand by A* search? Is it informed or uninformed search – Justify.   **[10]**

Q3) a) Explain steps involved in converting propositional logic statement into CNF with suitable example   **[10]**
   b) What do you understand by forward chaining and backward chaining. Explain in detail   **[10]**

Q4) a) Explain various methods of knowledge representation.   **[10]**

   b) What are local search algorithms? Explain any one in detail.   **[10]**

Q5) a) What is planning in AI? Discuss partial order planning and hierarchical planning in detail   **[10]**

   b) What do you understand by Reinforcement learning. Explain in detail.   **[10]**

Q6) Write short notes on **any two** of the following: **[20]**

   a) Wumpus World Environment

   b) Applications of AI

   c) Natural Language Processing

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