6E7105

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B.Tech. VI-Sem. (Main) Examination, July - 2023
Computer Science and Engineering (Artificial Intelligence)
6CAI4-05 Principles of Artificial Intelligence
CS,IT,AID, CAI

Time : 3 Hours **Maximum Marks : 70**

Instructions to Candidates:

Attempt all ten questions from Part A, five Questions out of seven questions from Part B and three questions out of five questions from Part C .

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

PART - A

(Answer should be given up to 25 words only)

All question are compulsory. **(10×2=20)**

1. What is the difference between intelligent agent and rational agent?
2. If a multi-agent system has 'n' agents, each of which has 'm' possible moves , the search space increases to how many possible states?
3. What is state space search for water jug problem?
4. Define heuristic function *h(n)*.
5. What is probability theory?
6. Compare forward chaining with backward chaining.
7. Write time and space complexity of BFS and DFS.
8. Define quantifiers and its types.
9. What are the three types of symbols which are used to indicate objects, relations and functions?
10. What is alpha-beta pruning?

PART - B

(Analytical/Problem solving questions)

Attempt any five questions. **(5×4=20)**

1. Highlight the differences between informed and uninformed search techniques.
2. What are constraint satisfaction problems? Trace the constraint satisfaction procedure solving the following cryptarithmetic problem:

$$\begin{array}{r} EAT \\ +THAT \\ \hline APPLE \end{array}$$

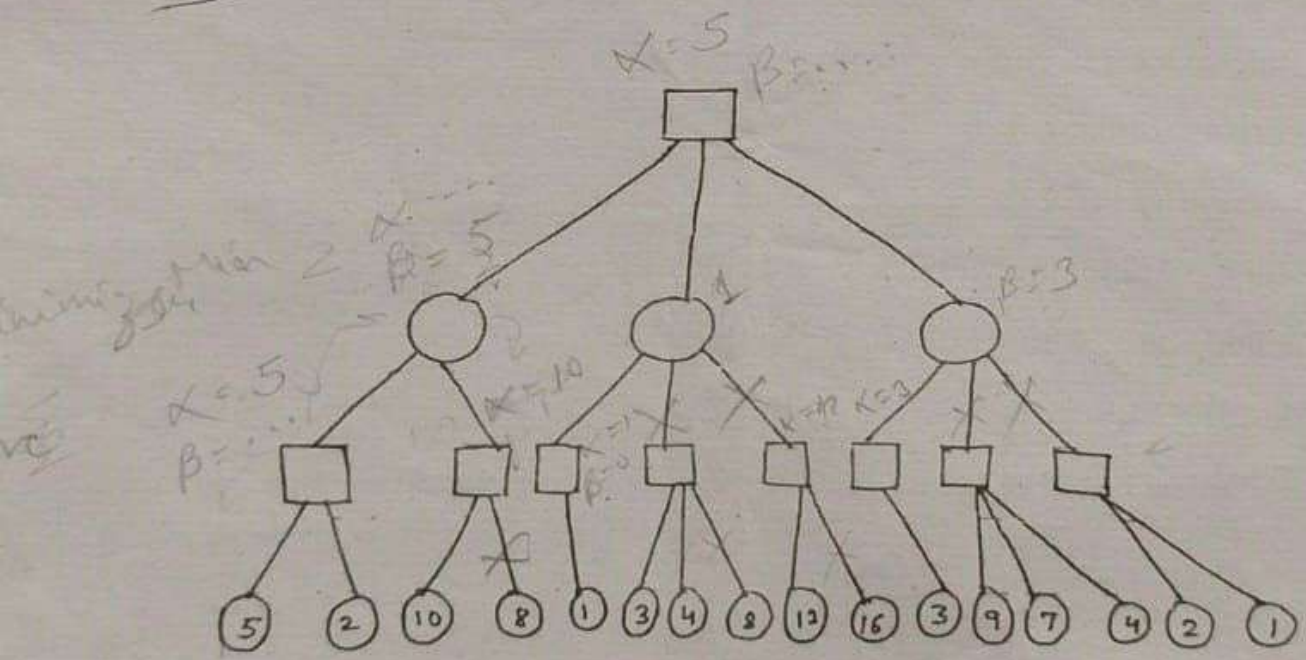
3. What reasoning deduction is more suitable heuristic in the game of chess: forward or backward? Justify your answer by refering to properties of search space.
4. Explain learning by decision trees taking an example.
5. Differentiate between propositional logic and first order logic.
6. What are neural networks? How they are used for learning in Artificial Intelligence?
7. What do you understand by the term "robotics"? How it is helpful in Artificial Intelligence?

PART - C

(Descriptive/Analytical/Problem solving/Design Questions)

Attempt any three questions. **(3×10=30)**

1. Discuss A* and AO* search algorithms taking examples. Also mention their advantage over greedy search method.
2. Explain how values are propagated in the game tree using MINIMAX and ALPHA-BETA pruning. Circle the nodes that will be pruned.



3. What is Bayesian Network? How is it used in representation of the uncertainty about knowledge. Explain the method of performing exact inference in Bayesian network.

4. Explain the supervised and unsupervised learning techniques along with examples. Also Mention their advantages and disadvantages.

5. a) Write about all the steps followed in natural language processing.

   b) Explain the architecture of expert systems.