

Seat. No. _____

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BE SEMESTER-VI (New) Examination April- 2025

Subject Name: Artificial Intelligence

Subject Code: CT601-N

Date: 04-04 -2025

Time: 12:30 pm to 3:30 pm

Total Marks: 70

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are Compulsory.
4. Indicate clearly, the option you attempt along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section-I

- Q-1** (A) List and Explain any 5 applications of AI. [5]
(B) What is agent? Write down types of agents and Explain any one in detail. [5]
(C) What is Water Jug Problem? Describe state space representation, actions, start and end state. [5]

OR

- (C) What is PEAS agent in AI? Explain Agent Environment. [5]

- Q-2** (A) What is Hill Climbing? List the types of Hill Climbing. Explain Steepest Ascent Hill Climbing in Detail. [5]
(B) Explain AO* in detail. [5]

OR

- Q-2** (A) Describe BFS and DFS with an Example. Compare BFS and DFS. [5]
(B) Discuss Alpha Beta Pruning with alpha – beta cut-offs procedure in game playing. [5]

- Q-3** (A) Elaborate Minimax algorithm with suitable example. [5]
(B) Solve the following Crypt-Arithmetic problem. [5]

S E N D
+ M O R E
M O N E Y

OR

- Q-3** (A) What is Knowledge based Agent? Explain architecture of Knowledge Based agent? [5]
(B) Solve the following Crypt-Arithmetic problem. [5]

B A S E
+ B A L L
G A M E S

Section-II

- Q-4 (A) What is the reasoning? Explain Forward and Backward Chaining? [5]
(B) Define Ontology. Discuss RDF with example. [5]
(C) Explain Recursion in prolog with an example. [5]

OR

- (C) Write a program to implement Arithmetic operators in PROLOG. [5]
- Q-5 (A) What is First Order Logic? Explain in detail Syntax and Semantic of First Order Logic. [5]
(B) Consider the following axioms: [5]

1. Every child loves Santa.
2. Everyone who loves Santa loves any reindeer.
3. Rudolph is a reindeer, and Rudolph has a red nose.
4. Anything which has a red nose is weird or is a clown.
5. No reindeer is a clown.
6. Scrooge does not love anything which is weird.

Prove using resolution – “Scrooge is not a child”.

OR

- Q-5 (A) Consider following axioms. [5]
1. Every child loves every Candy.
 2. Anyone who loves some candy is not a nutrition fanatic.
 3. Anyone who eats any pumpkin is a nutrition fanatic.
 4. Anyone who buys any pumpkin either carves it or eats it.
 5. John buys a pumpkin.
 6. Lifesaver is a candy.

Prove using resolution – “If John is a child, and then John carves some pumpkin.”

- (B) Discuss Cut and Fail predicates in Prolog. [5]
- Q-6 (A) Explain Bayesian Network with an example. [5]
(B) Explain Semantic web and Frames with an example. [5]

OR

- Q-6 (A) What is Fuzzy Logic? How is it used for Decision making under uncertainty. [5]
(B) Define and Discuss Belief Network in AI. [5]