Surendranath College

M.Sc. in Computer Science

Mid-Semester Examination, 2023

Semester: III

Paper Name: Artificial Intelligence

Paper Code: CSMC304

Time: 1 hour **Full marks: 30**

(Answer any *six* questions out of eight. Each question carrying *5 marks*)

1. Given two fuzzy sets A and B, A={(x1, 0.5), (x2, 0.1), (x3, 0.4)} and B={(x1, 0.2), (x2, 0.3), (x3, 0.5)}. What is the union of the two sets?
   What is the difference between *probability* and *fuzzy logic*? (2+3)

2. Explain the CART algorithm with an example.

3. Realize *AND* (2 inputs) using perceptron learning. Assume the *weights* are initialized to 0.5, and *Bias input* is 0.9.

4. Define the term *environment* and *agent* in the context of artificial intelligence. Differentiate between the working principles of a *utility-based agent* and a *goal-based agent*. (2 + 3)

5. What do you mean by *heuristic* ? How does Uniform Cost search differ from A* search? (2 + 3)

6. How can *Alpha-Beta pruning* improve searching by cutting-off a portion of the game tree? Explain with a suitable example.

7. Explain depth-first search algorithm with an example. State the approach that can alleviate the problem of unbounded trees in depth-first search. (3 + 2)

8. "*Iterative deepening is actually faster than breadth-first search, despite the repeated generation of states*" – Justify the statement with an example.