

M. Sc. (Computer Science and Applications) 4th Semester Examination – 2021 (CBCS)

Subject: Computer Science and Applications

Paper: MCSA – 402 (Elective – I: Artificial Intelligence and Application)

Full Marks: 40

Time: 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Answer any 8 (eight) questions. All questions carry equal marks of 5.

- 1) Discuss Modus ponens and Modus tollens with examples. 5
- 2) Using predicates, write the following sentences in symbolic form:
 - a) Only teachers like students.
 - b) Some teachers like only students. 5

Or,

Suppose the predicate $F(x, y, t)$ is used to represent the statement that person x can fool person y at time t . Give the best meaning of the formula $\forall x \exists y \exists t (\neg F(x, y, t))$? 5

- 3) Discuss 4 – Queens problem with example. 5
- 4) Find the solution steps from initial to goal states of Missionaries and Cannibals problem with the following statements:

The problem is specified like this. On one side of a river, there are three missionaries and three cannibals. There is a boat which can be used to transfer people from one side of the river to the other.

No more than two people can fit in the boat, and it must have at least one person in it during any transfer.

The problem is to find the shortest sequence of transfers which gets all six people from one side to the other without ever creating a situation where missionaries outnumber cannibals on either side of the river.

If at any time the ‘Cannibals outnumber the Missionaries’ on either bank of the river, they will eat the Missionaries.

5
- 5) Discuss AI based A* search algorithms. 5
- 6) Briefly explain different approaches to AI. 5
- 7) Classify and give brief definition of different types of agents. 5
- 8) Classify and give brief definition of different types of environments. 5

- 9) Define Soft Computing. Differentiate between soft computing and hard computing. 5
- 10) Define support, core, boundary and α – cut of a Fuzzy Set. 5