

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- MAY-2023

COURSE CODE(CREDITS): 21M11EC212 (3)

MAX. MARKS: 25

COURSE NAME: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

COURSE INSTRUCTORS: DR. NISHANT JAIN

MAX. TIME: 1 Hour 30 Minutes

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1. Consider a vocabulary with only three propositions, A, B, and C. How many models are there for the following sentences?

- $(A \wedge B) \rightarrow (B \wedge C)$
- $A \rightarrow (B \Leftrightarrow C)$
- $(A \wedge B)$

[3]

Q2. Following facts are given for Ankit:

- If Ankit is intelligent then Ankit will get good marks.
- Ankit scored good marks.

Represent the above as propositional rules and with the help of the propositional rules, infer if Ankit is Intelligent.

[3]

Q3. It is known that "The schools will be closed if it is raining or if there is a state holiday or national holiday."

- Define PEAS for the AI agent with respect to the above problem.
- Design propositional rules for the AI agent that helps the AI agent to infer if the school is closed or not.
- If it is raining, then explain how the AI agent will infer if the school is closed or not.

[3+2+2=7]

Q4. Consider the current state (s) of a Tic-Tac-Toe game as given below:

X	O	X
X	O	
O		X

Determine the value the following functions with respect to Tic-Tac-Toe game will return:

- Player(s)
- Action(s)
- Result(s,a) → Assume any appropriate value for "a" on your own
- Terminal(s)
- Utility(s)

[5]

Q5. Explain the working of the following algorithms with the help of a Maze game:

a. DFS

b. BFS

[4]

Q6. Explain and proof (by Truth Table) the following inference rules:

- Modus Ponens.
- Simplification.
- Resolution.

[3]