

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

B.Tech-IV Semester (CSE)

COURSE CODE (CREDITS): 24B11CI411 (3)

MAX. MARKS: 25

COURSE NAME: ARTIFICIAL INTELLIGENCE: RECENT TRENDS AND APPLICATIONS

COURSE INSTRUCTORS: AAYUSH SHARMA

MAX. TIME: 1 Hour 30 Min

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	CO	Marks
Q1	<p>You are given two 2D binary arrays, students and mentors, each of size $m \times n$, where $1 \leq m, n \leq 8$. Each row represents a person's answers to n yes/no survey questions (0 = no, 1 = yes). Every student is paired with exactly one mentor, and the compatibility score of a pair is the number of matching answers. Your task is to assign students to mentors to maximize the total compatibility score.</p> <p>For example, if students = $[[1,1,0],[1,0,1],[0,0,1]]$ and mentors = $[[1,0,0],[0,0,1],[1,1,0]]$, then the optimal pairing gives a total score of 8. If students = $[[0,0],[0,0],[0,0]]$ and mentors = $[[1,1],[1,1],[1,1]]$, the total score is 0. Return the maximum possible score.</p>	[CO1]	[10]
Q2	Describe the process of constructing a decision tree for classification problems.	[CO2] [CO1]	[3]
Q3	Define an expert system and describe its three main components: knowledge base, inference engine, and user interface. Provide one real-world example where expert systems are used.	[CO3] [CO2]	[3]
Q4	Explain how semantic networks represent relationships between objects and concepts. Illustrate with an example of a semantic network for the concept "Bird".	[CO3]	[3]
Q5	<p>In a grid-based search problem, consider a start point at A(2, 3) and a goal point at G(7, 6).</p> <p>(a) Calculate the Manhattan distance between A and G.</p> <p>(b) Calculate the Euclidean distance between the same two points.</p> <p>Show your working for both parts.</p>	[CO2]	[3X2]