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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATIONS- 2026

B.Tech-VII Semester (CSE/IT)

COURSE CODE (CREDITS): 18B1WCI742

MAX MARKS: 25

COURSE NAME: ARTIFICIAL INTELLIGENCE

COURSE INSTRUCTOR: VANI 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**(c) Use of calculator is allowed*

Q.No	Question	CO	Marks
Q1	Differentiate between A* and stochastic local search methods (Simulated Annealing, Genetic Algorithms) in terms of determinism, optimality, and search space exploration.	[2]	[5]
Q2	An email filtering system is used to detect spam messages. - The probability that an incoming email is spam is 0.3 - If an email is spam, the filter correctly classifies it as spam with probability 0.9 - If an email is not spam, the filter incorrectly classifies it as spam with probability 0.1 Using Bayes' Theorem, compute the probability that an email is actually spam given that the filter marks it as spam.	[2]	[5]
Q3	a) Show that the propositional formula $(\neg p) \wedge (\neg(p \wedge q))$ is logically equivalent to $\neg p$. b) Represent the following statements in First-Order Logic: - Emma is a researcher. - All researchers are scientists. - David is the director. - All directors are researchers. - All researchers admire the director or do not know him. - Everyone admires someone. - Scientists only criticize people who are not their colleagues. - Emma criticized David. Using the above knowledge base, determine whether the statement is true: "David is not a colleague of Emma."	[3]	[5+5]

Q4

Write the problem characteristics of 8 - puzzle problem. How many minimum steps are required for moving from initial state to final state in the below described problem:

Initial State

1	2	3
8	6	4
7		5

Final State

1	2	3
8		4
7	6	5

[2]

[5]