

Paper ID: 44608**L****T/P****C****Code: IT608 Paper: AI & Machine Learning****3****1****4****INSTRUCTIONS TO PAPER SETTERS: Maximum Marks: 75**

1. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

2. Apart from Question No. 1, rest of the paper shall consist of four units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 12.5 marks

Employability, Entrepreneurship & Skill Development**Course Outcomes:**

CO 1	Understand AI, and use state space search, heuristic search and control strategies.
CO 2	Understand and use knowledge representation, statistical reasoning.
CO 3	Understand and use fuzzy logic and genetic algorithms.
CO 4	Understand and use machine learning paradigms and neural networks.

Course Outcomes -Program Outcomes Matrix**Filled on a scale of 1 to 3 (3=High; 2=Moderate; 1=Low; '-'for no correlation)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	3	3	3	3	3	2	3	3	-	2	1	3
CO 2	3	3	3	3	3	2	3	3	-	2	1	3
CO 3	3	3	3	3	3	2	3	3	-	2	1	3
CO 4	3	3	3	3	3	2	3	3	-	2	1	3

UNIT 1

Foundations of Artificial Intelligence: AI Problems, AI Technique, criteria for success. State Space Search and control Strategies. Heuristic Search Techniques: Generate-and-Test, Hill Climbing, Best-first Search, Problem Reduction, Constraint Satisfaction, Means-ends Analysis, A* algorithm.

UNIT 2

Knowledge Representation: Representations and Mappings, Approaches and Issues in Knowledge Representation. Using Predicate Logic, Rules, Symbolic Reasoning under Uncertainty: Nonmonotonic reasoning. Statistical Reasoning: probability and Bayes theorem, certainty factors and rule-based systems, Bayesian networks, Dempster-Shafer theory. Weak slot-and-filler structures, Strong slot-and-filler structures.

UNIT 3

Fuzzy sets and fuzzy logic: Introduction, fuzzy sets, fuzzy set operations, types of membership functions, multi valued logic, fuzzy logic, linguistic variables and hedges, fuzzy propositions, inference rules for fuzzy propositions, fuzzy systems. Overview of genetic algorithms.

UNIT 4

Machine learning paradigms: Introduction, machine learning systems, supervised and unsupervised learning, inductive learning, deductive learning, clustering, support vector machines, case based reasoning and learning, Artificial neural networks: Introduction, artificial networks, single layer feed forward networks, multi layered forward networks, design issues of artificial neural networks.

Text:

1. Elaine Rich, Kevin Knight and Shivashankar B Nair, "Artificial Intelligence", 3rd Edition, Tata McGraw Hill, 2017
2. S. N. Sivanandam, S. N. Deepa, "Principles of Soft Computing", 2nd Edition, Wiley India, 2011

References:

1. Richard E. Neapolitan, Xia Jiang, "Artificial Intelligence with introduction to Machine Learning", 2nd edition, Chapman and Hall/CRC, 2018
2. S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", 3rd Edition, Pearson Education, 2015
3. G. A. VijayalakshmiPai, SanguthevarRajasekaran, "Neural Networks, Fuzzy Logic And Genetic Algorithm: Synthesis And Applications", 2nd Edition, PHI Learning, 2017