



# ANDHRA UNIVERSITY

## TRANS-DISCIPLINARY RESEARCH HUB

### ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

#### 1. Introduction to Artificial Intelligence (AI)

AI – Introduction, AI application areas, Predicate Calculus, Structures and Strategies for State Space Search, Heuristic Search, Control and implementation of State Space Search.

#### 2. Representation and Inference

Knowledge representation, Strong method problem solving, Reasoning in uncertain situations.

#### 3. Machine Learning and Models

Symbol-based learning framework, ID3 Decision Tree Induction Algorithm, Unsupervised Learning, Reinforcement Learning, Perceptron Learning, Backpropagation Learning, Competitive Learning, Artificial Life and Society-Based Learning, Hidden Markov Models (HMMs), Dynamic Bayesian Networks and Learning.

#### 4. Advanced AI Problem solving- I

Automated Reasoning - Introduction to Weak Methods in Theorem Proving, The General Problem Solver and Difference Tables, Resolution Theorem Proving, PROLOG and Automated Reasoning, Further Issues in Automated Reasoning,

#### 5. Advanced AI Problem solving- II

Understanding Natural Language- The Natural Language Understanding Problem, Deconstructing Language: An Analysis, Syntax, Transition Network Parsers and Semantics, Stochastic Tools for Language Understanding, Natural Language Applications

#### Text Books

1. “Artificial Intelligence- Structures and Strategies for Complex Problem Solving”, George F. Luger, Th 4 Edition, Pearson Education, 2003.

#### Reference Books

1. Artificial Intelligence, Knight, Tata MCGraw Hill
2. Artificial Intelligence ‘a Modern Approach, Russell &Norvig, second ediction, Pearson Education, 2003



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## MODEL QUESTION PAPER

### ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Answer any five questions

Max Marks 100

1. Discuss in detail about strategies for State Space Search. (20M)
2. Write in detail about (10+10)M
  - (a) Bayesian Reasoning
  - (b) Bayesian Belief Networks. (U-2)
3. (a) Explain in detail about Backpropagation Learning with an example. (12+8)M
  - (b) Discuss about symbol-based learning framework.
4. Discuss briefly about Resolution Theorem Proving. (20M)
5. (a) Give a detailed account of Stochastic tools for language understanding (12+8)M
  - (b) Write notes on Transition Network Parsers and Semantics
6. Explain heuristic search with an example. (20M)
7. (a) Briefly discuss about ID3 decision tree induction algorithm. (15+5)M
  - (b) Explain bagging and boosting issues.
8. Write notes on the following: (10+10)M
  - (a) General problem solver
  - (b) Natural language applications