

**Code No.: ETCS 408**  
**Paper: Artificial Intelligence**

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**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 of 12.5 marks.

**UNIT – I**

Scope of AI: Games, theorem proving, natural language processing, vision and speech processing, robotics, expert systems, AI techniques-search knowledge, abstraction.

Problem Solving (Blind): State space search; production systems, search space control; depth-first, breadth-first search.

Heuristic Based Search: Heuristic search, Hill climbing, best-first search, branch and bound, Problem Reduction, Constraint Satisfaction End, Means-End Analysis. **[No. of Hrs.: 12]**

**UNIT – II**

Game Playing: Game Tree, Minimax Algorithm, Alpha Beta Cutoff, Modified Minimax Algorithm, Horizon Effect, Futility Cut-off.

Knowledge Representation: Predicate Logic: Unification, Modus Ponens, Modus Tolens, Resolution in Predicate Logic, Conflict Resolution Forward Chaining, Backward Chaining, Declarative and Procedural Representation, Rule based Systems.

Structured Knowledge Representation: Semantic Nets: Slots, exceptions and default frames, conceptual dependency, scripts. **[No. of Hrs.: 12]**

**UNIT – III**

Handling Uncertainty: Non-Monotonic Reasoning, Probabilistic reasoning, use of certainty factors, fuzzy logic.

Natural Language Processing: Introduction, Syntactic Processing, Semantic Processing, Pragmatic Processing. **[No. of Hrs.: 10]**

**UNIT – IV**

Learning: Concept of learning, learning automation, genetic algorithm, learning by inductions, neural nets.

Expert Systems: Need and justification for expert systems, knowledge acquisition, Case Studies: MYCIN, RI. **[No. of Hrs.: 10]**

**TEXT BOOKS:**

1. E. Rich and K. Knight, "Artificial Intelligence", TMH, 2<sup>nd</sup> Ed., 1992.
2. N. J. Nilsson, "Principles of AI", Narosa Publ. House, 1990.
3. M. N. Hoda, "Foundation Course in Artificial Intelligence", Vikas Pub., 2004.

**REFERENCES BOOKS:**

1. P. H. Winston, "Artificial Intelligence", Pearson Education, 3rd Edition, 2002.
2. D. W. Patterson, "Introduction to AI and Expert Systems", PHI, 1992.
3. R. J. Schalkoff, "Artificial Intelligence – An Engineering Approach", McGraw Hill Int. Ed. Singapore, 1992.
4. M. Sasikumar, S. Ramani, "Rule Based Expert Systems", Narosa Publishing House, 1994.
5. Tim Johns, "Artificial Intelligence, Application Programming", Wiley Dreamtech, 2005.