

Elective Courses

BCA-5-02T-EC-A1: Introduction to Artificial Intelligence

Total Marks: 100
External Marks: 70
Internal Marks: 30
Credits: 6
Pass Percentage: 40%

INSTRUCTIONS FOR THE PAPER SETTER/EXAMINER

1. The syllabus prescribed should be strictly adhered to.
2. The question paper will consist of three sections: A, B, and C. Sections A and B will have four questions from the respective sections of the syllabus and will carry 10 marks each. The candidates will attempt two questions from each section.
3. Section C will have fifteen short answer questions covering the entire syllabus. Each question will carry 3 marks. Candidates will attempt any ten questions from this section.
4. The examiner shall give a clear instruction to the candidates to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.
5. The duration of each paper will be three hours.

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt any two questions each from the sections A and B of the question paper and any ten short questions from Section C. They have to attempt questions only at one place and only once. Second or subsequent attempts, unless the earlier ones have been crossed out, shall not be evaluated.

Course: Introduction to Artificial Intelligence	
Course Code: BCA-5-02T-EC-A1	
Course Outcomes (COs) After the completion of this course, the students will be able to:	
CO1	Explain the basic concepts, principles, and techniques of artificial intelligence.
CO2	Explore real-world applications of AI in various domains such as healthcare, finance, and robotics.
CO3	Develop the ability to identify and formulate problems that can be solved using AI techniques.
CO4	Apply AI solutions to address real-world challenges.
CO5	Describe the basic concepts, principles, and techniques for the development of expert systems

Detailed Contents:

Module	Module Name	Module Contents
Section-A		
Module I	Introduction to Artificial Intelligence	Definitions of AI, Intelligent Agents, Problem solving. Knowledge, Reasoning and Planning: Logical Agents, Classical Planning, Knowledge Representation and Reasoning. Learning: Learning from examples, Knowledge in learning.
Module II	Communicating, Perceiving and Acting	Communication, Natural Language Processing, Perception, Computer Vision, Robotics.
Module III	Searching	Searching for solutions, uniformed search strategies: Breadth first search, depth first Search. Search with partial information (Heuristic search) Hill climbing, A*, AO* Algorithms
Section-B		
Module IV	Expert Systems	Introduction, basic concepts, structure of expert systems, the human element in expert systems how expert systems works, problem areas addressed by expert systems, expert systems success factors, types of expert systems, knowledge engineering, scope of knowledge, difficulties, in knowledge acquisition methods of knowledge acquisition, machine learning, intelligent agents, selecting an appropriate knowledge acquisition method, societal impacts reasoning in artificial intelligence, inference with rules, with frames: model based reasoning, case based reasoning, explanation & meta knowledge inference with uncertainty representing uncertainty.
Module V	AI Applications (General)	Speech Recognition, Image Recognition, Natural Language Processing, Autonomous Transportation. Natural Language understanding, Recognizing objects and describing images, Dimensionality reduction, feature selection and feature extraction.
Module VI	AI Applications (Specific)	Virtual Personal Assistants/ Chatbots, Gaming, Smart Cars, Drones, Fraud Detection, Software Testing and Development, Business, Health Care, Education, Finance.

Books

1. S. Russel and P. Norvig, “Artificial Intelligence – A Modern Approach”, 2 nd Edition, Pearson Education.
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2. David Poole, Alan Mackworth, Randy Goebel, "Computational Intelligence: a logical approach", Oxford University Press.
3. G. Luger, "Artificial Intelligence: Structures and Strategies for complex problem solving", 4th Edition, Pearson Education.
4. J. Nilsson, "Artificial Intelligence: A new Synthesis", Elsevier Publishers.