

Satyug Darshan Institute of Engineering & Technology, Faridabad

Department of Computer Science & Engineering

Academic year 2025-26

Programme: B.Tech	Year & Semester: 2025-26 & 6 th
Course Name: INTELLIGENT SYSTEMS	Course Code: PCC-CS-601
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Unit I

Short answer questions

Q.N.	Question	KL
1	Define Artificial Neural Network (ANN) and mention its biological inspiration.	1
2	List any two basic components of an artificial neuron.	1
3	Explain the biological motivation behind artificial neural networks	2
4	State the objective of the backpropagation algorithm .	1
5	Explain the role of learning rate in backpropagation networks.	2

Long answer questions

Q.N.	Question	KL
1	Explain the structure of an artificial neural network and describe the function of its main components with a neat diagram.	2
2	Illustrate the backpropagation learning algorithm by explaining the forward pass, error computation, and weight update process.	3
3	Analyze the working of a Radial Basis Function (RBF) network and explain how it differs from a multilayer perceptron in terms of learning and architecture.	4
4	Examine the architecture of recurrent neural networks (RNNs) and analyze the role of feedback connections in handling temporal data.	4
5	Evaluate the suitability of ANN, Backpropagation networks, RBF networks, and RNNs for different intelligent system applications with justification.	5

Unit II

Short answer questions

Q.N.	Question	KL
1	Define fuzzy logic .	1
2	State the meaning of a membership function in fuzzy systems.	1
3	Explain the role of inference mechanism in knowledge representation.	2
4	Define a genetic algorithm .	1
5	Explain the concept of chromosome representation in genetic algorithms.	2

Long answer questions

Q.N.	Question	KL
1	Explain the basic components of a fuzzy logic system with a suitable example.	2

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2	Analyze different knowledge representation techniques and explain how inference is performed on them.	4
3	Illustrate the working of a genetic algorithm by explaining selection, crossover, and mutation operations.	3
4	Examine the architecture of fuzzy neural networks and explain how learning and fuzzification are integrated.	4
5	Evaluate the advantages and limitations of fuzzy logic, genetic algorithms, and fuzzy neural networks in intelligent system applications.	5

Unit III

Short answer questions

Q.N.	Question	KL
1	Define graph search and tree search .	1
2	State one key difference between breadth-first search (BFS) and depth-first search	1
3	Explain the purpose of iterative deepening search .	2
4	Define an admissible heuristic function	1
5	Explain the concept of hill climbing search .	2

Long answer questions

Q.N.	Question	KL
1	Explain the basic concepts of graph search and tree search , highlighting their advantages and limitations.	2
2	Illustrate the working of breadth-first search and depth-first search on a suitable example.	3
3	Analyze iterative deepening search and compare it with BFS and DFS in terms of time and space complexity.	4
4	Examine heuristic search methods with reference to best-first search and hill climbing search .	4
5	Evaluate the role of optimization techniques such as stochastic annealing and genetic algorithms in solving search problems.	5

Unit IV

Short answer questions

Q.N.	Question	KL
1	Define knowledge representation in artificial intelligence.	1
2	State any one issue in knowledge representation .	1
3	Define a semantic network .	1
4	Explain the purpose of frames in structured knowledge representation.	2
5	What is meant by logical inference ?	1

Long answer questions

Q.N.	Question	KL
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1	Explain the issues involved in knowledge representation with suitable examples.	2
2	Illustrate structured knowledge representation using frames and scripts with a simple example.	3
3	Analyze semantic networks and conceptual graphs as techniques for knowledge representation.	4
4	Examine the role of formal logic in logical inference within intelligent systems.	4
5	Evaluate the structure of knowledge-based systems , explaining their basic components and the significance of blackboard architecture .	5

Unit V

Short answer questions

Q.N.	Question	KL
1	Define reasoning under uncertainty .	1
2	State Bayes' theorem used in Bayesian reasoning .	1
3	Explain the meaning of a certainty factor .	2
4	What is Dempster-Shafer theory of evidential reasoning?	1
5	Explain the concept of induction learning .	2

Long answer questions

Q.N.	Question	KL
1	Explain the concept of reasoning under uncertainty and its importance in intelligent systems.	2
2	Illustrate Bayesian reasoning with a suitable numerical or real-world example.	3
3	Analyze the certainty factor model and explain how uncertainty is combined during inference.	4
4	Examine Dempster-Shafer theory and compare it with Bayesian reasoning for handling uncertainty.	4
5	Evaluate different learning and evolutionary algorithms , such as statistical learning and induction learning , highlighting their applications and limitations.	5