

Department of CSE (DATA SCIENCE)

B. Tech. Mid Question Bank (R20 Regulation)

Academic Year: 2024-2025

Semester: VII

Subject Name: Machine Learning [20AI702PC]

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PART-A

MID-I Questions					
Q.No	Questions	Marks	BL	CO	Unit No
1	What is a well-posed learning problem?	2M	L1	CO1	I
2	Define inductive bias in decision tree learning.	2M	L1	CO1	I
3	What is the Find-S algorithm used for?	2M	L2	CO1	I
4	Describe a version space in the context of concept learning.	2M	L1	CO1	I
5	What are the appropriate problems for decision tree learning?	2M	L2	CO1	I
6	Explain the term "hypothesis space" in decision tree learning.	2M	L2	CO1	I
7	What is the role of the back-propagation algorithm in neural networks?	2M	L3	CO2	II
8	Define perceptrons and their use in neural network learning.	2M	L1	CO2	II
9	What are the basics of sampling theory in the context of hypothesis evaluation?	2M	L1	CO2	II
10	Describe multilayer networks.	2M	L1	CO2	II
11	What is the motivation behind evaluating hypotheses in machine learning?	2M	L2	CO2	II
12	Explain the term "estimation hypothesis accuracy."	2M	L2	CO2	II
13	What is Bayes' theorem and its significance in machine learning?	2M	L3	CO3	III
14	Define the Naïve Bayes classifier.	2M	L1	CO3	III
15	What is the EM algorithm used for in Bayesian learning?	2M	L1	CO3	III
MID-II Questions					
16	Explain the k-nearest neighbor algorithm.	2M	L2	CO3	III
17	Describe the minimum description length principle.	2M	L2	CO3	III

18	What is case-based reasoning in instance-based learning?	2M	L1	CO3	III
19	What motivates the use of genetic algorithms in machine learning?	2M	L3	CO4	IV
20	Define sequential covering algorithms.	2M	L2	CO4	IV
21	What is the Q-learning algorithm in reinforcement learning?	2M	L1	CO4	IV
22	Describe the hypothesis space search in genetic algorithms.	2M	L2	CO4	IV
23	What are First-Order rules in the context of learning rule sets?	2M	L2	CO4	IV
24	Explain the term "temporal difference learning."	2M	L2	CO4	IV
25	What is PROLOG-EBG in the context of analytical learning?	2M	L1	CO5	V
26	Define explanation-based learning.	2M	L1	CO5	V
27	What is the role of prior knowledge in altering the search objective in analytical learning?	2M	L3	CO5	V
28	Describe the inductive-analytical approach to learning.	2M	L2	CO5	V
29	What is the significance of using prior knowledge to augment search operators?	2M	L1	CO5	V
30	Explain the motivation behind combining inductive and analytical learning.	2M	L2	CO5	V

PART-B

MID-I Questions					
Q.No	Questions	Marks	BL	CO	Unit No
1	Explain the concept learning task and how it relates to general-to-specific ordering.	3	L2	CO1	I
2	Discuss the candidate elimination algorithm and its role in maintaining version spaces.	3	L2	CO1	I
3	Describe the basic decision tree learning algorithm and the issues associated with it.	3	L1	CO1	I
4	What is the Find-S algorithm and how does it work in concept learning	3	L2	CO1	I
5	Explain the basic decision tree learning algorithm.	3	L2	CO1	I
6	Evaluate the effectiveness of the candidate elimination algorithm in concept learning.	3	L3	CO1	I
7	How does the Find-S algorithm find a maximally specific hypothesis? Illustrate with an example.	6	L2	CO1	I
8	Explain the inductive bias in decision tree learning with an example.	6	L2	CO1	I
9	Discuss the major perspectives and issues in machine learning.	6	L3	CO1	I
10	Discuss the neural network representation and the appropriate problems for neural network learning.	3	L3	CO2	II

11	Explain the back-propagation algorithm in detail and its significance in neural networks.	3	L2	CO2	II
12	Describe the process of face recognition using neural networks as an illustrative example.	3	L1	CO2	II
13	What is the back-propagation algorithm and how is it used in multilayer neural networks?	3	L1	CO2	II
14	Explain the process of deriving confidence intervals for hypothesis accuracy estimation.	3	L2	CO2	II
15	Evaluate the effectiveness of neural networks in face recognition tasks.	3	L3	CO2	II
16	What are confidence intervals, and how are they derived in the context of hypothesis evaluation?	6	L2	CO2	II
17	Compare and contrast different learning algorithms based on their error rates.	6	L3	CO2	II
18	Discuss the advanced topics in artificial neural networks and their applications.	6	L3	CO2	II
19	Explain the Maximum Likelihood hypothesis and its application in predicting probabilities.	3	L2	CO3	III
20	Discuss the Bayes optimal classifier and the Gibbs algorithm.	3	L3	CO3	III
21	Describe the process of learning to classify text using the Naïve Bayes classifier.	3	L2	CO3	III
MID-II Questions					
22	Explain the concept of probably learning an approximately correct hypothesis in computational learning theory.	3	L2	CO3	III
23	Illustrate how the k-nearest neighbour algorithm works with an example	3	L3	CO3	III
24	Evaluate the effectiveness of the EM algorithm in Bayesian belief networks.	3	L3	CO3	III
25	Discuss the process and significance of genetic programming in hypothesis space search.	3	L3	CO4	IV
26	Explain the relationship between genetic algorithms and models of evolution and learning.	3	L2	CO4	IV
27	Describe the process of parallelizing genetic algorithms and its benefits.	3	L1	CO4	IV
28	Describe the basic concept of Genetic Algorithms and their motivation.	3	L1	CO4	IV
29	Explain how the FOIL algorithm is used to learn sets of First-Order rules.	3	L2	CO4	IV
30	Evaluate the effectiveness of Q-learning in reinforcement learning tasks.	3	L3	CO4	IV
31	Discuss the Q-learning algorithm and its application in reinforcement learning with an example.	6	L2	CO4	IV
32	Explain the concept of inverting resolution in learning First-Order rules.	6	L2	CO4	IV
33	Compare and contrast sequential covering algorithms and FOIL in learning rule sets.	6	L3	CO4	IV
34	Discuss the process of learning with perfect domain theories using PROLOG-EBG.	3	L1	CO5	V

35	Explain the concept of explanation-based learning of search control knowledge.	3	L2	CO5	V
36	Describe how prior knowledge can be used to initialize the hypothesis in combined learning approaches.	3	L1	CO5	V
37	Explain the concept of Explanation-Based Learning (EBL) .	3	L2	CO5	V
38	Analyze how prior knowledge can be used to alter the search objective in Analytical Learning.	3	L3	CO5	V
39	How does using prior knowledge help in initializing the hypothesis in this context?	3	L3	CO5	V
40	Compare and contrast inductive learning and analytical learning with examples.	6	L3	CO5	V
41	Discuss the methods and benefits of using prior knowledge to augment search operators.	6	L3	CO5	V
42	Explain the various inductive-analytical approaches to learning and their applications.	6	L2	CO5	V

