SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

QUESTION BANK

VI SEMESTER

1922602 - MACHINE LEARNING TOOLS AND TECHNIQUES

Regulation – 2019

Academic Year 2024 – 2025 (EVEN)

Prepared by

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SUBJECT : 1922602 - Machine Learning Tools and Techniques
SEM / YEAR: VI Sem/ III Year

UNIT I INTRODUCTION			
Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces and Candidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search			
PART – A			
Q.No.	**Questions**	**BT Level**	**Competence**
1	What is machine learning? Give some examples.	**BTL1**	**Remembering**
2	State the inductive Learning Hypothesis.	**BTL1**	**Remembering**
3	List out the four modules in the final design in checkers learning problem.	**BTL1**	**Remembering**
4	Enlist the types of machine learning techniques.	**BTL1**	**Remembering**
5	Define Learning. Mention some example for learning problems.	**BTL1**	**Remembering**
6	List the algorithms of concept learning.	**BTL1**	**Remembering**
7	Distinguish between supervised and unsupervised learning.	**BTL2**	**Understanding**
8	Draw basic learning system model.	**BTL2**	**Understanding**
9	Compare traditional programming and machine learning.	**BTL2**	**Understanding**
10	Mention the issues in machine learning.	**BTL2**	**Understanding**
11	Illustrate Entropy in decision tree learning.	**BTL2**	**Understanding**
12	Classify positive and negative examples for the target concept.	**BTL1**	**Remembering**
13	Explain the useful perspective on machine learning.	**BTL1**	**Remembering**
14	Comment on Heuristic Space Search.	**BTL2**	**Understanding**
15	Sketch a decision tree for playing tennis game.	**BTL2**	**Understanding**
16	Analyze the statement “Concept learning as a search”.	**BTL2**	**Understanding**
17	List applications of machine learning.	**BTL1**	**Remembering**
18	Elucidate about the Decision tree learning.	**BTL1**	**Remembering**
19	Summarize the concept of Biased Hypothesis Space.	**BTL1**	**Remembering**
20	Summarize the various steps in designing a program to learn to play checkers.	**BTL2**	**Understanding**
21	Evaluate the relationship between AI and Machine learning.	**BTL2**	**Understanding**
22	Assess the role of Information gain in Decision trees.	**BTL2**	**Understanding**
23	Formulate the instances for the Enjoy Sport concept learning task?	**BTL1**	**Remembering**
24	Construct the summary of choices in designing the checkers learning program.	**BTL2**	**Understanding**

PART – B			
1	State the three features to have a well-defined learning problem for the following (i) A checkers learning problem (4) (ii) A handwritten recognition learning problem (4) (iii) A robot driving learning problem (5)	**BTL3**	**Applying**
2	Summarize the steps in detail about how to design a program to learn to play checkers. (13)	**BTL3**	**Applying**
3	(i) Discuss the concept learning as search. (7) (ii) Describe the General-to-Specific Ordering of Hypotheses. (6)	**BTL3**	**Applying**
4	(i)Describe in detail the rule for estimating training values. (7) (ii)State the final design of checkers learning system. (6)	**BTL4**	**Analyzing**
5	Write about the different issues in Machine Learning. (13)	**BTL4**	**Analyzing**
6	Write Short notes on (i) Attribute Selection (3) (ii) Entropy (5) (iii) Information gain (5)	**BTL3**	**Applying**
7	Illustrate the Compact Representation for Version Spaces. (13)	**BTL3**	**Applying**
8	Summarize the Candidate–Elimination Algorithm with an example. (13)	**BTL3**	**Applying**
9	Explain in detail about Machine Learning Process with an example. (13)	**BTL3**	**Applying**
10	Explain the useful perspectives of machine learning in different applications. (13)	**BTL3**	**Applying**
11	Illustrate the basic decision tree algorithm with an example. (13)	**BTL3**	**Applying**
12	Analyze the Inductive bias in decision tree learning. (13)	**BTL4**	**Analyzing**
13	Assess the Hypothesis space search in decision tree learning. (13)	**BTL4**	**Analyzing**
14	(i)Illustrate with a diagram the decision tree representation for the concept of play tennis. (7) (ii)List the appropriate problems for Decision tree learning. (6)	**BTL4**	**Analyzing**
15	(i) Evaluate the FIND-S: Finding a Maximally Specific Hypothesis. (7) (ii) Find the key properties of FIND-S algorithm. (6)	**BTL5**	**Evaluating**
16	Evaluate the List-Then-Eliminate Algorithm in detail. (13)	**BTL5**	**Evaluating**
17	(i)Generalize the concept of Learning task. (7) (ii)With the help of training example explain the Inductive Learning Hypothesis. (6)	**BTL6**	**Creating**
PART – C			
1	Sketch and explain the decision tree to represent the following Boolean functions: a) $A \cap B$ (3) b) $A \cup [B \cap C]$ (4) c) $A \oplus$ B (4) d) $[A \cap B] \cup [C \cap D]$ (4)	**BTL5**	**Evaluating**

<table>
<tr><td>2</td><td>Draw and solve the decision trees for the following set of training examples. (15)
<table>
<tr><th>Day</th><th>Outlook</th><th>Temperature</th><th>Humidity</th><th>Wind</th><th>Play Tennis</th></tr>
<tr><td>D1</td><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr>
<tr><td>D2</td><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr>
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<tr><td>D12</td><td>Overcast</td><td>Mild</td><td>High</td><td>Strong</td><td>Yes</td></tr>
<tr><td>D13</td><td>Overcast</td><td>Hot</td><td>Normal</td><td>Weak</td><td>Yes</td></tr>
<tr><td>D14</td><td>Rain</td><td>Mild</td><td>High</td><td>Strong</td><td>No</td></tr>
</table></td><td>BTL5</td><td>Evaluating</td></tr>
<tr><td>3</td><td>Write short notes about the following:
(i)Will the Candidate –Elimination Algorithm Converge to the Correct Hypothesis? (8)
(ii)What Training Example Should the Learner Request Next? (7)</td><td>BTL6</td><td>Creating</td></tr>
<tr><td>4</td><td>(i) Formulate the Candidate-Elimination algorithm. (5)
(ii) Explain the candidate elimination algorithm. Apply the algorithm to obtain the final version space for the training example. (10)
<table>
<tr><th>Sl.No</th><th>Sky</th><th>Air temp</th><th>Humidity</th><th>Wind</th><th>Water</th><th>Forecast</th><th>Enjoy sport</th></tr>
<tr><td>1</td><td>Sunny</td><td>Warm</td><td>Normal</td><td>Strong</td><td>Warm</td><td>Same</td><td>Yes</td></tr>
<tr><td>2</td><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Warm</td><td>Same</td><td>Yes</td></tr>
<tr><td>3</td><td>Rainy</td><td>Cold</td><td>High</td><td>Strong</td><td>Warm</td><td>Change</td><td>No</td></tr>
<tr><td>4</td><td>Sunny</td><td>Warm</td><td>High</td><td>Strong</td><td>Cold</td><td>Change</td><td>Yes</td></tr>
</table></td><td>BTL6</td><td>Creating</td></tr>
<tr><td>5</td><td>(i) Explain in detail an Unbiased Learner for Enjoy sport learning task. (8)
(ii) List out about the Futility of Bias-Free Learning. (7)</td><td>BTL6</td><td>Creating</td></tr>
</table>

UNIT II NEURAL NETWORKS AND GENETIC ALGORITHMS			
Neural Network Representation – Problems – Perceptrons – Multilayer Networks and Back Propagation Algorithms – Advanced Topics – Genetic Algorithms – Hypothesis Space Search – Genetic Programming – Models of Evaluation and Learning			
PART – A			
Q.No.	**Questions**	**BT Level**	**Competence**
1	State the concept of Artificial Neural Network.	**BTL1**	**Remembering**
2	List out the characteristic of the back propagation algorithm.	**BTL1**	**Remembering**
3	Describe with an example Neural network representation.	**BTL1**	**Remembering**
4	Label the linearly separable sets of examples.	**BTL1**	**Remembering**
5	State the problem of crowding.	**BTL1**	**Remembering**
6	What are all the Boolean functions represented by perceptron?	**BTL1**	**Remembering**
7	Describe about Genetic Algorithm.	**BTL2**	**Understanding**
8	What type of unit we can use as the basis for constructing multilayer network?	**BTL2**	**Understanding**
9	Summarize about the Schema in Genetic Algorithm.	**BTL2**	**Understanding**
10	Enlist the types of Neural Networks.	**BTL2**	**Understanding**
11	What are the advantages of genetic algorithm?	**BTL2**	**Understanding**
12	Examine about the Baldwin Effect.	**BTL1**	**Remembering**
13	Illustrate Hypothesis space search.	**BTL2**	**Understanding**
14	Explain the program tree representation in genetic programming.	**BTL2**	**Understanding**
15	Identify the steps involved in Genetic Algorithm.	**BTL2**	**Understanding**
16	Compare and contrast the gradient descent and Delta rule.	**BTL1**	**Remembering**
17	Explain why perceptron to represent AND, OR, NAND and NOR is important.	**BTL2**	**Understanding**
18	Illustrate the Lamarckian Evolution.	**BTL1**	**Remembering**
19	Analyze the application areas of Neural networks.	**BTL2**	**Understanding**
20	Assess about the Back propagation algorithm.	**BTL2**	**Understanding**
21	Explain about the genetic programming.	**BTL2**	**Understanding**
22	State the importance of Back propagation algorithm.	**BTL1**	**Remembering**
23	Formulate the biological motivation for studying ANN.	**BTL2**	**Understanding**
24	How hypothesis in Genetic Algorithm is represented?	**BTL2**	**Understanding**
PART – B			
1	(i) Define Perceptrons with neat diagram. (7) (ii) Describe about perceptron with an example and draw the decision surface represented by a two-input perceptron. (6)	**BTL3**	**Applying**
2	What is the Perceptron Training rule? Enumerate the Back propagation algorithm. (13)	**BTL3**	**Applying**
3	Label the genetic programming and draw the program tree representation in genetic programming. Explain with suitable examples. (13)	**BTL3**	**Applying**
4	List out and explain the recent applications areas where Neural Networks plays vital role. (13)	**BTL4**	**Analyzing**
5	Write in detail about the Population Evolution and the Schema Theorem. (13)	**BTL4**	**Analyzing**

6	Illustrate the different types of Neural Networks along with its merits and demerits. (13)	**BTL3**	**Applying**
7	Describe the delta training rule with an example. (13)	**BTL3**	**Applying**
8	Define fitness function. Examine how genetic algorithm searches large space of candidate objects with an example According to fitness function. (13)	**BTL3**	**Applying**
9	(i) Illustrate the diagram for visualizing the Hypothesis space. (7) (ii) Examine the derivation of the Gradient Descent Rule. (6)	**BTL3**	**Applying**
10	List and explain the common operators in Genetic Algorithm. (13)	**BTL3**	**Applying**
11	Explain hypothesis space search of GAs with neural network back propagation. (13)	**BTL3**	**Applying**
12	Explain the multi-layer perceptron model with a neat diagram. (13)	**BTL4**	**Analyzing**
13	Asses some of the important application domain of Neural networks with real time use cases. (15)	**BTL4**	**Analyzing**
14	Summarize the derivation of the back propagation algorithm (13)	**BTL4**	**Analyzing**
15	Explain Detail about the Gradient Descent algorithm. (13)	**BTL5**	**Evaluating**
16	Evaluate the Models of evolution and learning in Genetic Algorithms. (13)	**BTL5**	**Evaluating**
17	Assess for which problems is ANN learning is well suited and write down the characteristics. (13)	**BTL6**	**Creating**
PART – C			
1	Explain in detail the following (i) Alternative Error Functions (8) (ii) Alternative Error Minimization Procedures (7)	**BTL5**	**Evaluating**
2	Assess the different types of Neural Networks and the various applications of neural networks in detail. (15)	**BTL5**	**Evaluating**
3	Outline the concepts of Inductive Bias and Generalize the Hidden Layer Representations. (15)	**BTL6**	**Creating**
4	Formulate the models of evolution and learning in Genetic algorithm. (15)	**BTL6**	**Creating**
5	Derive the Training rule for Output Unit weights and Hidden Unit weights in Backpropagation algorithm. (15)	**BTL6**	**Creating**

UNIT III BAYESIAN AND COMPUTATIONAL LEARNING			
Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naive Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model			
PART – A			
Q.No.	**Questions**	**BT Level**	**Competence**
1	List the advantages of studying Bayesian learning methods.	**BTL1**	**Remembering**
2	Define Bayes Theorem.	**BTL1**	**Remembering**
3	Describe Maximum likelihood.	**BTL1**	**Remembering**
4	What is Minimum Description Length principle?	**BTL1**	**Remembering**
5	Name the Bayes optimal classification.	**BTL1**	**Remembering**
6	State about the Gibbs Algorithm.	**BTL1**	**Remembering**
7	Write the formulas of basic probability	**BTL2**	**Understanding**
8	Find the formula for probability density function.	**BTL2**	**Understanding**
9	Summarize the advantages of EM algorithm.	**BTL2**	**Understanding**
10	Describe Brute-Force Map Learning Algorithm.	**BTL2**	**Understanding**
11	Illustrate the Shattering a Set of Instances	**BTL2**	**Understanding**
12	State the advantages of Gibbs algorithm.	**BTL3**	**Applying**
13	List the set of three instances shattered by eight hypotheses.	**BTL3**	**Applying**
14	Explain about the EM algorithm.	**BTL3**	**Applying**
15	Illustrate the mistake bound model of learning.	**BTL3**	**Applying**
16	Differentiate Bayes theorem and concept learning.	**BTL4**	**Analyzing**
17	Assess the true error of a Hypothesis.	**BTL4**	**Analyzing**
18	Compare and contrast Finite and Infinite Hypothesis Spaces	**BTL4**	**Analyzing**
19	Enlist some of the applications of Naive Bayes classifier.	**BTL4**	**Analyzing**
20	Explain Bayesian belief networks.	**BTL5**	**Evaluating**
21	Deduce €-exhausting the version space	**BTL5**	**Evaluating**
22	Evaluate the steps in EM Algorithm.	**BTL5**	**Evaluating**
23	Generalize the Probably Approximately Correct (PAC) learning model.	**BTL6**	**Creating**
24	Formulate the term sample complexity.	**BTL6**	**Creating**
PART – B			
1	(i) What is the €-exhausting the version space? (7) (ii) Write about the Learning and Inconsistent Hypotheses. (6)	**BTL4**	**Analyzing**
2	State and explain about the steps involved in EM algorithm. (13)	**BTL4**	**Analyzing**
3	Write short notes on Estimating Means of k Gaussians. (13)	**BTL3**	**Applying**
4	Explain in detail about Naive Bayes classifier with examples. (13)	**BTL3**	**Applying**
5	(i) Examine the detail of probability learning. (7) (ii) Define the Error of a Hypothesis. (6)	**BTL4**	**Analyzing**
6	Write about sample complexity for finite hypothesis Spaces. (13)	**BTL4**	**Analyzing**
7	Illustrate about the Bayesian belief networks with suitable examples. (13)	**BTL3**	**Applying**
8	(i) Examine the detail about Bayes theorem with an Example. (7) (ii) Outline the features of Bayesian learning method. (6)	**BTL3**	**Applying**

9	Illustrate with an example why Gibbs Algorithm is better than the Bayes Optimal classifier. (13)	**BTL3**	**Applying**
10	Infer the minimum description length principle. (13)	**BTL3**	**Applying**
11	How we can handle uncertainty? Enlist the application domains of Probability. (13)	**BTL3**	**Applying**
12	maximum likelihood algorithm. (13)	**BTL4**	**Analyzing**
13	Explain detail about the PAC Learnability. (13)	**BTL4**	**Analyzing**
14	Illustrate the sample complexity for infinite hypothesis spaces and write a short note on vapnik-chervonenkis dimension. (13)	**BTL4**	**Analyzing**
15	(i) Summarize in detail the relationship between Bayes theorem and Concept learning. (7) (ii) Write down the Brute force Bayes Concept Learning. (6)	**BTL3**	**Applying**
16	Evaluate the mistake bound model of learning. (13)	**BTL3**	**Applying**
17	Formulate about the Bayes optimal classifier and Elaborate the Bayes optimal classification problem with examples. (13)	**BTL3**	**Applying**
PART – C			
1	(i) Summarize the General Statement of EM Algorithm. (8) (ii) Deduce k -Means Algorithm. (7)	**BTL5**	**Evaluating**
2	(i)Assess the Bayesian belief network. (8) (ii) Mention the Importance of Bayesian network is used to infer values of target variable? (7)	**BTL5**	**Evaluating**
3	Does the patient have cancer, or does he not? A patient takes a lab test and the result comes back positive. The test returns a correct positive result in only 98% of the cases in which the disease is actually present, and a correct negative result in only 97% of the cases in which the disease is not present. Furthermore, 0.008 of the entire population have this cancer. (15)	**BTL6**	**Creating**
4	Formulate about the €-exhausting the version space and write about the Learning from Inconsistent Hypotheses. (15)	**BTL6**	**Creating**

5	<table><tr><th>Day</th><th>Outlook</th><th>Temperature</th><th>Humidity</th><th>Wind</th><th>Play Tennis</th></tr><tr><td>D1</td><td>Sunny</td><td>Hot</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>D2</td><td>Sunny</td><td>Hot</td><td>High</td><td>Strong</td><td>No</td></tr><tr><td>D3</td><td>Overcast</td><td>Hot</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>D4</td><td>Rain</td><td>Mild</td><td>High</td><td>Weak</td><td>Yes</td></tr><tr><td>D5</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D6</td><td>Rain</td><td>Cool</td><td>Normal</td><td>Strong</td><td>No</td></tr><tr><td>D7</td><td>Overcast</td><td>Cool</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>D8</td><td>Sunny</td><td>Mild</td><td>High</td><td>Weak</td><td>No</td></tr><tr><td>D9</td><td>Sunny</td><td>Cool</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D10</td><td>Rain</td><td>Mild</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D11</td><td>Sunny</td><td>Mild</td><td>Normal</td><td>Strong</td><td>Yes</td></tr><tr><td>D12</td><td>Overcast</td><td>Mild</td><td>High</td><td>Strong</td><td>Yes</td></tr><tr><td>D13</td><td>Overcast</td><td>Hot</td><td>Normal</td><td>Weak</td><td>Yes</td></tr><tr><td>D14</td><td>Rain</td><td>Mild</td><td>High</td><td>Strong</td><td>No</td></tr></table> A set of 14 training examples of the target concept Play Tennis, where each day is described by the attributes Outlook, Temperature, Humidity, and Wind. Use the Naive Bayes classifier and the training data from this table to classify the following novel instance: (Outlook = sunny, Temperature = cool, Humidity = high, Wind = strong). (15)	**BTL6**	**Creating**

UNIT IV INSTANT BASED AND ADVANCED LEARNING			
INSTANT BASED LEARNING: K- Nearest Neighbour Learning – Locally weighted Regression – Radial Basis Functions – Case Based Learning. ADVANCED LEARNING: Learning Sets of Rules – Sequential Covering Algorithm – Learning Rule Set – First Order Rules – Sets of First Order Rules – Induction on Inverted Deduction – Inverting Resolution –Analytical Learning – Perfect Domain Theories – Explanation Base Learning – FOCL Algorithm – Reinforcement Learning – Task – Q-Learning – Temporal Difference Learning			
PART – A			
Q.No.	**Questions**	**BT Level**	**Competence**
1	Define the formula for the distance between two instances.	**BTL1**	**Remembering**
2	State the k-nearest neighbor learning algorithm.	**BTL1**	**Remembering**
3	Write about the locally weighted regression.	**BTL1**	**Remembering**
4	Define Turing-equivalent programming language.	**BTL1**	**Remembering**
5	What is Reinforcement learning model?	**BTL1**	**Remembering**
6	Define Resolution. State the resolution rule.	**BTL1**	**Remembering**
7	Distinguish between lazy versus eager learning?	**BTL2**	**Understanding**
8	Interpret the importance of Temporal learning.	**BTL2**	**Understanding**
9	Distinguish between CADET and k-nearest Neighbor.	**BTL2**	**Understanding**

10	Compare Inductive and Analytical Learning Problems.	**BTL2**	**Understanding**
11	Summarize about the FOIL algorithm.	**BTL2**	**Understanding**
12	Predict the accuracy of radial basis function network.	**BTL1**	**Remembering**
13	Illustrate how the Instance-based learning methods differ from function approximation.	**BTL1**	**Remembering**
14	Interpret the concepts of first-order Horn clauses.	**BTL1**	**Remembering**
15	Illustrate what is Sequential Covering Algorithm.	**BTL1**	**Remembering**
16	Outline the concept of Q learning algorithm.	**BTL1**	**Remembering**
17	Analyze the terms Regression, Residual, and Kernel function.	**BTL2**	**Understanding**
18	How the learn rule sets differ from genetic algorithm?	**BTL2**	**Understanding**
19	Examine deductive resolution and inductive resolution.	**BTL1**	**Remembering**
20	Explain inductive logic programming.	**BTL1**	**Remembering**
21	Assess the three lazy learning methods.	**BTL1**	**Remembering**
22	Evaluate the Prolog-EBG.	**BTL1**	**Remembering**
23	Write the formula for Locally Weighted Linear-Regression.	**BTL1**	**Remembering**
24	Sketch the voronoi diagram for k nearest neighbour.	**BTL2**	**Understanding**
PART – B			
1	(i) Illustrate the disadvantages of Instance-based methods. (7) (ii) Examine the k-nearest learning algorithm. (6)	**BTL4**	**Analyzing**
2	Describe the disadvantages and advantages of Lazy and Eager learning. (13)	**BTL4**	**Analyzing**
3	Explain the types of Reinforcement learning with examples. (13)	**BTL3**	**Applying**
4	(i) Summarize the steps involved in Sequential Covering Algorithm. (7) (ii) Explain the Learn one rule on one example. (6)	**BTL3**	**Applying**
5	Illustrate Locally Weighted Linear Regression with an example. (13)	**BTL4**	**Analyzing**
6	Explain the inductive bias of k-Nearest neighbor algorithm with example. (13)	**BTL4**	**Analyzing**
7	Summarize about the Q-learning model and explain with diagram. (13)	**BTL3**	**Applying**
8	Outline the concepts of learning task and temporal difference learning. (13)	**BTL2**	**Understanding**
9	State the prototypical example of case-based reasoning system. (13)	**BTL3**	**Applying**
10	Illustrate the diagram for the search for rule preconditions as learn-one-rule proceeds from general to specific. (13)	**BTL3**	**Applying**
11	List the learning sets of first-order rules and explain the basic FOIL algorithm. (13)	**BTL3**	**Applying**
12	Outline the concepts of the radial basis functions. (13)	**BTL4**	**Analyzing**
13	(i)Write about the learning Rule sets. (7) (ii)Write some common evaluation functions in the learning rule sets. (6)	**BTL4**	**Analyzing**
14	Analyze about the Analytical learning model with example. (13)	**BTL4**	**Analyzing**
15	Examine in detail about distance-weighted nearest neighbour algorithm. (13)	**BTL3**	**Applying**
16	Assess the learning sets of rules and how it differs from other algorithms. (13)	**BTL3**	**Applying**

17	Formulate the Explanation Based Learning approaches and its application domains in detail. (13)	**BTL3**	**Applying**
PART – C			
1	Compare the difference between the Lazy and Eager learning algorithms. (15)	**BTL5**	**Evaluating**
2	Describe the Temporal Difference Learning model with an example. (15)	**BTL5**	**Evaluating**
3	Generalize the concept of inverting resolution model. (15)	**BTL6**	**Creating**
4	Compose the error E(x,) to emphasize the fact that now the error is being defined as a function of the query point x. (15)	**BTL6**	**Creating**
5	Summarize the merits and demerits of FOCL Algorithm. (15)	**BTL6**	**Creating**

UNIT V MACHINE LEARNING TOOLS

Introduction to Weka, The Explorer, The Knowledge Flow Interface, The Command-Line Interface, Introduction to TensorFlow, Installation and Basics. Other ML Tools: AI Explainability 360, Apollo, Data Science Version Control (DVC), Espresso, EuclidesDB, Fabrik, Face_recognition, Ludwig, makesense.ai, MLflow, MLPerf, ModelDB, Netron, NLP Architect, OpenML, Orange, PySyft, RAPIDS, SHAP, Skater, Snorkel, VisualDL, What-If Tool

PART – A

Q.No.	Questions	BT Level	Competence
1	Expand WEKA. Define the purpose of Weka Tool in ML.	**BTL1**	**Remembering**
2	State the use of MLflow.	**BTL1**	**Remembering**
3	List out the features of TensorFlow.	**BTL1**	**Remembering**
4	Define the role of MLPerf.	**BTL1**	**Remembering**
5	Mention the role of Fabrik Tool in Machine Learning.	**BTL1**	**Remembering**
6	State the primary purpose of VisualDL.	**BTL1**	**Remembering**
7	Enlist the features of Weka Tool.	**BTL2**	**Understanding**
8	What is version control in data science?	**BTL2**	**Understanding**
9	Distinguish between DVC and MLflow.	**BTL2**	**Understanding**
10	Why is RAPIDS considered scalable for parallelizing and accelerating data science workflows?	**BTL2**	**Understanding**
11	Interpret how Netron is used for visualizing deep learning models.	**BTL2**	**Understanding**
12	Identify the knowledge flow interface in Weka.	**BTL1**	**Remembering**
13	Discover federated learning using Pytorch and Pysyft.	**BTL1**	**Remembering**
14	Comment about Pytorch based Espresso tool.	**BTL1**	**Remembering**
15	Determine the need for OpenML platform in ML.	**BTL1**	**Remembering**
16	Analyze real-world applications of face recognition.	**BTL1**	**Remembering**
17	Assess the labeling functions in Snorkel.	**BTL2**	**Understanding**
18	Infer SHAP and list the importance features of SHAP?	**BTL2**	**Understanding**
19	Analyze the features of EuclidesDB ML Tool.	**BTL1**	**Remembering**
20	Examine how does Data Science Version Control works.	**BTL1**	**Remembering**
21	Apprise the role of Explainable Artificial Intelligence (XAI).	**BTL1**	**Remembering**
22	Evaluate the functionalities of NLP Architect Library.	**BTL1**	**Remembering**
23	Formulate the three types of federated learning.	**BTL1**	**Remembering**
24	Write the important steps in What-If analysis?	**BTL2**	**Understanding**

PART – B			
1	How can you load a dataset and apply a machine learning algorithm using the Weka Explorer? (13)	**BTL4**	**Analyzing**
2	Enlist the features of TensorFlow Machine Learning Tool and briefly explain about each feature. (13)	**BTL4**	**Analyzing**
3	Describe the key features and use cases of Skater in model interpretation and debugging? (13)	**BTL3**	**Applying**
4	What role does SHAP play in explaining the output of machine learning models, and how are Shapley values calculated? (13)	**BTL3**	**Applying**
5	Explain the purpose and advantages of using the Knowledge Flow Interface in Weka? (13)	**BTL4**	**Analyzing**
6	Describe the key features of Ludwig and how it makes deep learning accessible without coding? (13)	**BTL4**	**Analyzing**
7	Interpret the purpose of MLPerf and how it contributes to measure the performance of machine learning workloads. (13)	**BTL2**	**Understanding**
8	How does Snorkel assist in creating labeled training data programmatically? (13)	**BTL2**	**Understanding**
9	In what scenarios would you prefer using the command-line interface in Weka over the graphical interfaces? (13)	**BTL3**	**Applying**
10	Identify the MLflow components with example use cases. (13)	**BTL3**	**Applying**
11	How Microsoft Fabric empowers data scientists to build AI solutions. (13)	**BTL3**	**Applying**
12	Analyze the purpose of Data Science Version Control (DVC) and how it differs from traditional version control systems? (13)	**BTL4**	**Analyzing**
13	Assess the various scenarios would you choose to use PySyft for federated learning. (13)	**BTL4**	**Analyzing**
14	Examine how RAPIDS accelerate data science and analytics tasks, especially on GPUs. (13)	**BTL4**	**Analyzing**
15	Evaluate how MLflow streamline the machine learning lifecycle, and brief its main components. (13)	**BTL3**	**Applying**
16	Assess the functionalities of ModelDB for managing machine learning models and experiments. (13)	**BTL3**	**Applying**
17	Formulate the significance of makesense.ai and the steps involved in the context of computer vision and model annotation? (13)	**BTL3**	**Applying**
PART – C			
1	Explain the purpose and advantages of using the Knowledge Flow Interface in Weka? (15)	**BTL5**	**Evaluating**
2	Evaluate the important machine learning tools necessary for Data Scientist. (15)	**BTL5**	**Evaluating**
3	Formulate the significance of Data Science Version Control (DVC) and how it differs from traditional version control systems. (15)	**BTL6**	**Creating**
4	How does the What-If Tool facilitate the exploration and understanding of machine learning models. (15)	**BTL6**	**Creating**
5	What is TensorFlow and explain the steps involved in installing TensorFlow on your local machine. (15)	**BTL6**	**Creating**

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