SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)
SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OFCOMPUTER SCIENCE ANDENGINEERING

QUESTION BANK

VII SEMESTER

1904706 INTRODUCTION TO MACHINE LEARNING AND ALGORITHMS
Regulation – 2019

Academic Year 2022 – 23 (ODD SEM)

Prepared by

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SRM VALLIAMMAI ENGNIEERING COLLEGE
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SUBJECT : **1904706 INTRODUCTION TO MACHINE LEARNING AND ALGORITHMS**
SEM / YEAR: VII/IV

UNIT I – INTRODUCTION			
Learning Problems – Perspectives and Issues – Concept Learning – Version Spaces andCandidate Eliminations – Inductive bias – Decision Tree learning – Representation – Algorithm – Heuristic Space Search.			
PART-A (2 MARKS)			
Q. No	QUESTIONS	Competence	BT Level
1.	Why Machine learning is important?	Remember	BTL1
2.	Classify positive and negative examples for the target concept.	Apply	BTL3
3.	Mention the summary of choices in designing the checkers learning program.	Apply	BTL3
4.	List applications of machine learning.	Analyze	BTL4
5.	Illustrate terms of machine learning.	Remember	BTL1
6.	Sketch a decision tree for an example of play tennis.	Analyze	BTL4
7.	Summarize the various steps in designing a program to learn to play checkers.	Evaluate	BTL5
8.	Write short notes on concept learning as a search.	Remember	BTL1
9.	Mention the issues in machine learning.	Understand	BTL2
10.	Describe the four modules of final design in checkers learning problem.	Remember	BTL1
11	Explain the useful perspective on machine learning.	Evaluate	BTL5
12.	State the inductive Learning Hypothesis.	Remember	BTL1
13.	List the algorithms of concept learning.	Remember	BTL1
14.	Summarize the concept of Biased Hypothesis Space.	Create	BTL6
15.	Write about the Decision tree learning.	Analyze	BTL4
16.	Discuss the effect of reduced Error pruning in decision tree algorithm.	Understand	BTL2
17.	What are the instances for the EnjoySport concept learning task?	Create	BTL6
18.	Examine how we use the more-general-than partial ordering to organize the search for a hypothesis consistent with the observed training examples.	Apply	BTL3
19.	Express how three Hypotheses h1, h2, h3 from EnjoySport example are related by the >=g relation?	Understand	BTL2
20.	Label the set of instances with an example.	Understand	BTL2
21.	Give professor Mitchell definition for Machine learning.	Understand	BTL2
22.	What are the three attributes for choosing the training experience?	Evaluate	BTL5

23.	Write the LIST-THEN-ELIMINATE algorithm.		Analyze	BTL4
24.	Show 'Enjoysport' concept learning algorithm.		Apply	BTL3
	PART-B (13- MARKS)			
1.	State the three features to have a well-defined learning problem for the following (i)A checkers learning problem. (ii)A handwritten recognition learning problem. (iii)A robot driving learning problem.	 (4) (4) (5)	Remember	BTL1
2.	Summarize the steps in detail about how to design a program to learn to play checkers.	(13)	Understand	BTL2
3.	(i)Describe in detail the rule for estimating training values. (ii)State the final design of checkers learning system.	(7) (6)	Remember	BTL1
4.	Explain the useful perspectives of machine learning in different applications.	(13)	Apply	BTL3
5.	Discuss about the different issues in Machine Learning.	(13)	Understand	BTL2
6.	(i)Generalize the concept of Learning task. (ii)With the help of training example explain the Inductive Learning Hypothesis.	(7) (6)	Create	BTL6
7.	(i)Explain the concept learning as search. (ii)Describe the General-to-Specific Ordering of Hypotheses.	(7) (6)	Remember	BTL1
8.	(i)Illustrate with a diagram the decision tree representation for the concept of play tennis. (ii)List the appropriate problems for Decision tree learning.	(7) (6)	Apply	BTL3
9.	(i)Explain in detail the FIND-S: Finding a Maximally Specific Hypothesis. (ii) Assess and write the key properties of FIND-S algorithm.	(7) (6)	Evaluate	BTL5
10.	Explain the following : (i)Compact Representation for Version Spaces. (ii)The LIST-THEN-ELIMINATE Algorithm.	 (7) (6)	Analyze	BTL4
11.	Illustrate the basic decision tree algorithm with an example.	(13)	Apply	BTL3
12.	Summarize the Candidate–Elimination Algorithm with an example.	(13)	Understand	BTL2
13.	(i)Define Inductive Bias. (ii)Write short notes on biased Hypothesis Space.	(3) (10)	Remember	BTL1
14.	(i) Explain in detail an Unbiased Learner for Enjoy sport learning task. (ii) Point out the Futility of Bias-Free Learning.	(7) (6)	Analyze	BTL4
15.	Analyze and Write the steps involved in Designing a learning system. Explain each step in detail.	(13)	Analyze	BTL4
16.	(i) Summarize the concept of decision tree representation. (ii)List appropriate problems for decision tree learning.	(7) (6)	Evaluate	BTL5

<table>
<tr><td>17.</td><td>(i)Will the Candidate-Elimination Algorithm Converge to the Correct Hypothesis? Explain.
(ii) Summarize your view on how can partially Learned concepts be used.</td><td>(7)
(6)</td><td>Create</td><td>BTL2</td></tr>
<tr><td colspan="5">PART-C (15- MARK)</td></tr>
<tr><td>1.</td><td>Sketch and explain the decision tree to represent the following Boolean functions:
a) $A \cap B$
b) $A \cup [B \cap C]$
c) A xor B
d) $[A \cap B] \cup [C \cap D]$</td><td>(15)</td><td>Create</td><td>BTL6</td></tr>
<tr><td>2.</td><td>Draw and solve the decision trees for the following set of training examples
<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>
.</td><td>(15)</td><td>Create</td><td>BTL6</td></tr>
<tr><td>3.</td><td>Write short notes about the following:
(i)Will the Candidate –Elimination Algorithm Converge to the Correct Hypothesis?
(ii)What Training Example Should the Learner Request Next?</td><td>
(7)
(8)</td><td>Evaluate</td><td>BTL5</td></tr>
<tr><td>4.</td><td>(i) Assess about the Candidate-Elimination algorithm.
(ii)Explain the Candidate Elimination algorithm. Apply the algorithm to obtain the final version space for the training example.
<table>
<tr><th>SI.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>(7)
(8)</td><td>Evaluate</td><td>BTL5</td></tr>
</table>

5.	Consider the following set of training examples: (i) What is the entropy of this collection of training examples with respect to the target function classification? (ii) Assess the information gain of a2 relative to these training examples?	(8) (7)	Evaluate	BTL5

Instance	Classification	X1	X2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

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 (2 - MARKS)

Q.No	QUESTIONS	BT Level	Competence
1.	Define the biological motivation for studying ANN.	Create	BTL6
2.	State the concept of Artificial neural network.	Remember	BTL1
3.	Describe with an example Neural network representation.	Remember	BTL1
4.	Label the linearly separable sets of examples.	Remember	BTL1
5.	List out the characteristic to which the back propagation algorithm is used.	Remember	BTL1
6.	Compare and contrast the gradient descent and Delta rule.	Analyze	BTL4
7.	What are all the Boolean functions represented by perceptron?	Remember	BTL1
8.	Assess about the Back propagation algorithm.	Evaluate	BTL5
9.	What type of unit we can use as the basis for constructing multilayer network?	Understand	BTL2
10.	why perceptron is important to represent AND, OR, NAND and NOR .	Analyze	BTL4
11.	How hypothesis in Genetic Algorithm is represented?	Create	BTL6
12.	Describe about Genetic Algorithm.	Understand	BTL2
13.	What are the advantages of genetic algorithm?	Understand	BTL2
14.	Examine about the Baldwin Effect.	Apply	BTL3
15.	Distinguish between crossover and mutation.	Analyze	BTL4
16.	Write short notes on crowding.	Remember	BTL1
17.	Explain about the genetic programming.	Evaluate	BTL5
18.	Illustrate the Lamarckian Evolution.	Apply	BTL3
19.	Summarize about the Schema in GA.	Understand	BTL2
20.	Explain the program tree representation in genetic programming.	Apply	BTL3
21.	Define Percerptron.	Apply	BTL3
22.	Give some common operators for genetic algorithm.	Understand	BTL2

23.	Assess and Write Gradient Descent algorithm for training a linear unit.		Evaluate	BTL5
24.	Compare key differences between standard gradient descent and stochastic gradient descent		Analyze	BTL4
PART-B (13 MARKS)				
1.	Explain the multi-layer perceptron model with a neat diagram.	(13)	Analyze	BTL4
2.	Assess for which problems is ANN learning is well suited and write down the characteristics.	(13)	Create	BTL6
3.	(i)Illustrate the diagram for visualizing the Hypothesis space. (ii) Analyze about the derivation of the Gradient Descent Rule.	(7) (6)	Analyze	BTL4
4.	(i)Summarize the derivation of the Back propagation Algorithm. (ii)Explain in detail about theGradient Descent algorithm.	(7) (6)	Evaluate	BTL5
5.	(i) Examine Perceptron with a neat diagram. (ii)Describe about perceptron with an example and draw the decision surface represented by a two-input perceptron.	(7) (6)	Remember	BTL1
6.	(i)What is Perceptron Training rule? (ii)Enumerate about the Back propagation algorithm.	(3) (10)	Remember	BTL1
7.	(i)Distinguish between Gradient descent and Delta rule. (ii)Describethe delta training rule with an example.	(5) (8)	Understand	BTL2
8.	(i)Explore how the hypothesis in GAs are represented by bit strings. (ii)Write about the IF-THEN rules and the reason why it can be encoded.	(7) (6)	Analyze	BTL4
9.	(i)List out the Genetic algorithm steps with example. (ii) Illustrate the prototypical genetic algorithm.	(8) (5)	Remember	BTL1
10.	(i)List and explain the common operators for Genetic Algorithm. (ii)State about the various crossovers with diagram.	(7) (6)	Apply	BTL3
11.	(i)Define fitness function. (ii)Examine how genetic algorithm searches large space of candidate objects according to fitness function.	(3) (10)	Understand	BTL2
12	(i)Explain hypothesis space search of GAs with neural network back propagation. (ii)Illustrate what is Add Alternative and Drop Condition.	(7) (6)	Apply	BTL3
13.	Write in detail the Population Evolution and the Schema Theorem.	(13)	Understand	BTL2
14.	(i)Label the genetic programming and draw the program tree representation in genetic programming. (ii) Explain the genetic programming with an example.	(7) (6)	Remember	BTL1
15.	Summarize instantiation of the Genetic algorithm in GABIL.	(13)	Evaluate	BTL5
16.	Discuss Genetic algorithm with example.	(13)	Understand	BTL2
17.	(i) Illustrate in detail about Differentiable Threshold Unit. (ii) Explain Back propagation Algorithm.	(7) (6)	Apply	BTL3
PART-C (15 -MARKS)				
1.	Outline the concepts of Inductive Bias and Generalize the Hidden Layer Representations.	(15)	Create	BTL6
2.	Explain in detail the following		Evaluate	BTL5

	(i)Alternative Error Functions. (ii) Alternative Error Minimization Procedures.	(8) (7)		
3.	Formulate the models of evolution and learning in Genetic algorithm.	(15)	Create	BTL6
4.	Assess the parallelizing Genetic Algorithms with an example.	(15)	Evaluate	BTL5
5.	Design a genetic algorithm to learn conjunctive classification rules for the Play Tennis problem.	(15)	Create	BTL6

UNIT-III BAYESIAN AND COMPUTATIONAL LEARNING

Bayes Theorem – Concept Learning – Maximum Likelihood – Minimum Description Length Principle – Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Network – EM Algorithm – Probability Learning – Sample Complexity – Finite and Infinite Hypothesis Spaces – Mistake Bound Model.

PART-A (2 - MARKS)

1.	List the advantages of studying Bayesian learning methods.	Remember	BTL1
2.	Define Bayes Theorem.	Remember	BTL1
3.	DescribeMaximum likelihood.	Remember	BTL1
4.	What is Minimum Description Length principle?	Remember	BTL1
5.	Name the Bayes optimal classification.	Remember	BTL1
6.	State about the Gibbs Algorithm.	Remember	BTL1
7.	Write the formulas of basic probability	Understand	BTL2
8.	Differentiate Bayes theorem and concept learning.	Analyze	BTL4
9.	Explain Bayesian belief networks.	Evaluate	BTL5
10.	Find the formula for probability density function.	Understand	BTL2
11.	Generalize the Probably Approximately Correct (PAC) learning model.	Create	BTL6
12.	Illustrate the mistake bound model of learning.	Apply	BTL3
13.	Assess about the true error.	Analyze	BTL4
14.	Formulate the term sample complexity.	Create	BTL6
15.	Summarize the advantages of EM algorithm.	Understand	BTL2
16.	Deduce €-exhausting the version space	Evaluate	BTL5
17.	Describe Brute-Force Map Learning Algorithm.	Understand	BTL2
18.	Explain about the EM algorithm.	Analyze	BTL4
19.	List the set of three instances shattered by eight hypotheses.	Apply	BTL3
20.	Illustrate about Shattering a Set of Instances	Understand	BTL2
21.	Show the formula to calculate posterior probability in Brute-Force MAP learning algorithm.	Apply	BTL3
22.	Pointout the equation for Minimum Description Length principle.	Analyze	BTL4
23.	Classify the types of Bayes optimal classification.	Apply	BTL3
24.	Define Gibbs Algorithm.	Evaluate	BTL5

PART-B (13- MARKS)

1.	(i)Examine the detail about Bayes theorem with an Example. (ii)Outline the features of Bayesian learning method.	(7) (6)	Understand	BTL2
2.	(i)Summarize in detail the relationship between Bayes theorem and Concept learning. (ii)Write down the Brute force Bayes Concept Learning.	(7) (6)	Evaluate	BTL5
3.	Explain in detail aboutmaximum likelihood algorithm.	(13)	Analyze	BTL4

<table>
<tr><td>4.</td><td>Illustrate with an example why Gibbs Algorithm is better than the Bayes Optimal classifier.</td><td>(13)</td><td>Apply</td><td>BTL3</td></tr>
<tr><td>5.</td><td>(i)What is minimum description length principle?
(ii)Describe the concepts of Minimum Description Length principle.</td><td>(3)
(10)</td><td>Understand</td><td>BTL2</td></tr>
<tr><td>6.</td><td>(i)Write about the Bayes optimal classifier.
(ii)Elaborate the Bayes optimal classification.</td><td>(7)
(6)</td><td>Create</td><td>BTL6</td></tr>
<tr><td>7.</td><td>(i)Illustrate the naïve Bayes classifier.
(ii)Explain naive Bayes classifier with example.</td><td>(7)
(6)</td><td>Analyze</td><td>BTL4</td></tr>
<tr><td>8.</td><td>(i)Illustrate about the Bayesian belief networks
(ii)Describe the conditional Independence.</td><td>(7)
(6)</td><td>Remember</td><td>BTL1</td></tr>
<tr><td>9.</td><td>(i)State about the about the EM algorithm.
(ii)Write short notes onEstimating Means of k-Gaussians.</td><td>(7)
(6)</td><td>Remember</td><td>BTL1</td></tr>
<tr><td>10.</td><td>(i)Examine the detail of probability learning.
(ii)Define theError of a Hypothesis.</td><td>(7)
(6)</td><td>Remember</td><td>BTL1</td></tr>
<tr><td>11.</td><td>Explain detail about the PAC Learnability.</td><td>(13)</td><td>Analyze</td><td>BTL4</td></tr>
<tr><td>12.</td><td>(i)Write about sample complexity for finite hypothesis Spaces.
(ii)Outline the mistake bound model of learning.</td><td>(7)
(6)</td><td>Understand</td><td>BTL2</td></tr>
<tr><td>13.</td><td>(i)What is the €-exhausting the version space?
(ii)Write about the Learning and Inconsistent Hypotheses.</td><td>(7)
(6)</td><td>Remember</td><td>BTL1</td></tr>
<tr><td>14.</td><td>(i)Illustrate the sample complexity for infinite hypothesis spaces.
(ii)Write a short note on vapnik-chervonenkis dimension.</td><td>(7)
(6)</td><td>Apply</td><td>BTL3</td></tr>
<tr><td>15.</td><td>Discuss in detail about Brute-Force MAP Learning Algorithm.</td><td>(13)</td><td>Understand</td><td>BTL2</td></tr>
<tr><td>16.</td><td>Demonstrate the following:
(i)GIBBS algorithm.
(ii) Naive Bayes classifier.</td><td>
(6)
(7)</td><td>Apply</td><td>BTL3</td></tr>
<tr><td>17.</td><td>Explain Bayesian belief network with an example.</td><td>(13)</td><td>Evaluate</td><td>BTL5</td></tr>
<tr><td colspan="5">PART-C (15 -MARKS)</td></tr>
<tr><td>1.</td><td>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.</td><td>(15)</td><td>Create</td><td>BTL6</td></tr>
<tr><td>2.</td><td>(i)Assess theBayesian belief network.
(ii)Mention the Importance of Bayesian network is used to infer values of target variable?</td><td>(15)</td><td>Evaluate</td><td>BTL5</td></tr>
<tr><td>3.</td><td>
<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>
</table>
</td><td>(15)</td><td>Create</td><td>BTL6</td></tr>
</table>

	D5	Rain	Cool	Normal	Weak	Yes			
	D6	Rain	Cool	Normal	Strong	No			
	D7	Overcast	Cool	Normal	Strong	Yes			
	D8	Sunny	Mild	High	Weak	No			
	D9	Sunny	Cool	Normal	Weak	Yes			
	D10	Rain	Mild	Normal	Weak	Yes			
	D11	Sunny	Mild	Normal	Strong	Yes			
	D12	Overcast	Mild	High	Strong	Yes			
	D13	Overcast	Hot	Normal	Weak	Yes			
	D14	Rain	Mild	High	Strong	No			
	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)								
4.	(i)Summarize the General Statement of EM Algorithm. (ii) Deduce k -Means Algorithm.						(8) (7)	Evaluate	BTL5
5.	Assess the practical importance of Bayesian learning methods with an Example.						(15)	Evaluate	BTL5
UNIT IV- INSTANT BASED LEARNING									
K-NearestNeighbourLearning–LocallyweightedRegression–RadialBasisFunctions–Case Based learning									
PART-A (2 -MARKS)									
1.	Define the formula for the distance between two instances.							Remember	BTL1
2.	Predict the accuracy of radial basis function network.							Apply	BTL3
3.	Describe the k-nearest neighbor learning algorithm.							Remember	BTL1
4.	Illustrate how the Instance-based learning methods differ from function approximation.							Apply	BTL3
5.	Explain the the k-nearest neighbour algorithm for approximating a discrete-valued function.							Analyze	BTL4
6.	What is the nature of the hypothesis space H implicitly considered by the k-nearest neighbour algorithm?							Remember	BTL1
7.	Write about the locally weighted regression.							Remember	BTL1
8.	Identify the distance-weighted nearest neighbour algorithm.							Remember	BTL1
9.	State about thecurse of dimensionality.							Remember	BTL1
10.	Differentiate Regression, Residual, Kernel function.							Analyze	BTL4
11.	Give the advantages of instance –based methods.							Understand	BTL2
12.	Summarize the advantage and disadvantage of Locally weighted Regression.							Understand	BTL2
13.	Distinguish between lazy versus eager learning.							Understand	BTL2
14.	Pointout three properties that are shared by the Instance-based methods.							Analyze	BTL4
15.	Assess the three lazy learning methods.							Evaluate	BTL5
16.	Sketch the voronoi diagram for k-Nearest Neighbor.							Apply	BTL3

17.	Explain radial basis functions.		Evaluate	BTL5
18.	Write the formula for Locally Weighted Linear -Regression.		Create	BTL6
19.	What is the inductive bias of k-Nearest Neighbor?		Analyze	BTL4
20.	Distinguish between CADET and k-Nearest Neighbor.		Understand	BTL2
21.	Show the k-Nearest Neighbor algorithm for approximating a discrete-valued function.		Apply	BTL3
22.	Give the definition for Kernel function.		Understand	BTL2
23.	Assess about Locally Weighted Regression.		Evaluate	BTL5
24.	Draw a radial basis function network.		Create	BTL6
PART-B (13- MARKS)				
1.	(i) Illustrate the disadvantages of Instance –based methods. (ii) Examine the k-nearest learning algorithm.	(7) (6)	Apply	BTL3
2.	Assess the detail about distance-weighted nearest neighbour algorithm.	(13)	Evaluate	BTL5
3.	(i)Explain Locally weighted linear regression. (ii)Illustrate Locally Weighted Linear Regression with an example.	(7) (6)	Create	BTL6
4.	(i)Outline the concepts of the radial basis functions. (ii)Describe the two stage process of the RDF networks.	(7) (6)	Analyze	BTL4
5.	(i)Summarize the detail about locally weighted regression (ii)Summarize the pros and cons of Locally weighted regression.	(7) (6)	Understand	BTL2
6.	Explain the inductive bias of k-Nearest Neighbor algorithm with example.	(13)	Analyze	BTL4
7.	List and explain the generic properties of case-based reasoning systems.	(13)	Understand	BTL2
8.	State the prototypical example of case-based reasoning system.	(13)	Remember	BTL1
9.	How the lazy learning differs from other learning model explain with example?	(13)	Remember	BTL1
10.	Examine in detail about the Instance-based learning methods.	(13)	Remember	BTL1
11.	(i)Explain in detail about eager learning. (ii)How the eager learning differs from lazy learning?	(7) (6)	Analyze	BTL4
12.	Illustrate several generic properties of case –based Reasoning systems	(13)	Apply	BTL3
13.	Outline the concepts of CADET system with an example.	(13)	Understand	BTL2
14.	Describe the disadvantages and advantages of Lazy and Eager learning.	(13)	Remember	BTL1
15.	(i)Explain Distance-Weighted Nearest Neighbor Algorithm. (ii) Assess and write about the Remarks on k- Nearest Neighbor Algorithm.	(7) (6)	Evaluate	BTL5
16.	Demonstrate about Locally Weighted Regression.	(13)	Apply	BTL3
17.	Summarize radial basis function network with neat diagram.	(13)	Understand	BTL2
PART-C (15-MARKS)				
1.	Explain in detail about the Case-based reasoning (CBR).	(15)	Evaluate	BTL5
2.	Compare the difference between the Lazy and Eager learning	(15)	Evaluate	BTL5

	algorithms.			
3.	Illustrate the Generalize the Locally weighted regression model.	(15)	Create	BTL6
4.	Predict the error E(x,) to emphasize the fact that now the error is being defined as a function of the query point x.	(15)	Create	BTL6
5.	Derive the gradient descent rule for a distance-weighted local linear approximation to the target function.	(15)	Create	BTL6

UNIT V- 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 (2 -MARKS)

1.	What is explanation based learning?	Remember	BTL1
2.	Interpret the concepts of first-order Horn clauses.	Apply	BTL3
3.	State the learn-one-rule.	Remember	BTL1
4.	Illustrate what is Sequential Covering Algorithm.	Apply	BTL3
5.	Examine the Prolog-EBG.	Apply	BTL3
6.	Describe Inverting resolution.	Remember	BTL1
7.	List out the terminology in Horn clause.	Remember	BTL1
8.	Define Turing-equivalent programming language.	Remember	BTL1
9.	Explain about the Reinforcement learning model.	Remember	BTL1
10.	How the learn rule sets differ from genetic algorithm?	Analyze	BTL4
11.	Interpret the importance of Temporal learning.	Understand	BTL2
12.	Write about the sequential covering algorithm for learning a disjunctive set of rules.	Understand	BTL2
13.	Distinguish between the FOIL and the other algorithm.	Understand	BTL2
14.	Generalize induction as inverted deduction.	Create	BTL6
15.	Explain inductive logic programming.	Evaluate	BTL5
16.	Outline the concept of Q learning algorithm.	Analyze	BTL4
17.	Compare Inductive and Analytical Learning Problems	Evaluate	BTL5
18.	Assess a Proportional form if clauses C1 and C2 are given.	Create	BTL6
19.	Define the Horn clause.	Analyze	BTL4
20.	Summarize about the FOIL algorithm.	Understand	BTL2
21.	Predicts equential covering algorithm.	Understand	BTL2
22.	Compare the two most substantial differences between FOIL and Sequential-Coverage Algorithm.	Analyze	BTL4
23.	Write Q learning algorithm.	Apply	BTL3
24.	Rewrite the resolution rules in Inverting Resolution.	Evaluate	BTL5

PART-B(13 MARKS)

1.	Assess the learning sets of rules and how it differs from other algorithms.	(13)	Evaluate	BTL5
2.	(i)Summarize the steps involved in Sequential Covering Algorithm. (ii)Explain the Learn one rule on one example.	(7) (6)	Analyze	BTL4

3.	Outline the concepts of learning task and temporal difference learning.	(13)	Understand	BTL2
4.	(i)Write in detail sequential –covering algorithm. (ii)State about the AQ algorithm.	(7) (6)	Remember	BTL1
5.	Elucidate the detail the first order logic basic definitions.	(13)	Analyze	BTL4
6.	Illustrate the diagram for the search for rule preconditions as learn-one-rule proceeds from general to specific.	(13)	Apply	BTL3
7.	(i)Write about the learning Rule sets. (ii)Write some common evaluation functions in the learning rule sets.	(7) (6)	Analyze	BTL4
8.	Demonstrate the concepts of induction as inverted deduction.	(13)	Apply	BTL3
9.	Discuss in detail Learning First-order rules.	(13)	Understand	BTL2
10.	(i)List the learning sets of first-order rules: FOIL (ii)Memorize about the Basic Foil algorithm.	(7) (6)	Remember	BTL1
11.	(i)Describe about learning with perfect domain theories: PROLOG-EBG (ii)Identify any training with example for PROLOG-EBG.	(7) (6)	Remember	BTL1
12.	Summarize about the Q-learning model and explain with diagram.	(13)	Understand	BTL2
13.	(i)Explain Reinforcement learning with an example. (ii)Prove the theory of Temporal difference learning.	(7) (6)	Create	BTL6
14.	Describe about the Analytical learning model with example.	(13)	Remember	BTL1
15.	Summarize the implementation for LEARN-ONE-RULE specific for beam search.	(13)	Understand	BTL2
16.	Illustrate about the explanation-based learning algorithm PROLOG-EBG.	(13)	Apply	BTL3
17.	Assess and explain an analytical learning problem: SafeToStack(x,y)	(13)	Evaluate	BTL5
PART-C (15 MARKS)				
1.	Assess the following horn clauses (i) First-Order Horn Clauses (ii) Basic terminology in horn clauses.	(8) (7)	Create	BTL6
2.	Generalize the concept of inverting resolution model.	(15)	Create	BTL6
3.	Summarize the merits and demerits of FOCL Algorithm	(15)	Evaluate	BTL5
4.	Describe the Temporal Difference Learning model with an example.	(15)	Evaluate	BTL5
5.	Analyze in detail about Reinforcement Learning.	(15)	Evaluate	BTL5