VR17   Reg. No: ☐☐☐☐☐☐☐☐☐☐

VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

III/IV B.Tech. DEGREE EXAMINATION, OCTOBER, 2020

Sixth Semester

INFORMATION TECHNOLOGY

<u>17IT3601 MACHINE LEARNING</u>

Time: 3hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part-B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. List one problem that could be solved with machine learning.
    b. Define Baye's theorem.
    c. List out a problem, which can be best solved by Naïve Baye's classifier.
    d. Define hypothesis space.
    e. List one major difference between classification and regression.
    f. Write one major difference between supervised and unsupervised learning.
    g. How support vectors will be chosen in SVM?
    h. Mcculloch-pitt neuron is same as perceptron?
    i. Are KNN and K-Means belongs to same category of machine learning?
    j. List out evolutionary computing methodologies.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Elaborately discuss any two machine learning models.   **8M**

   b. Discuss about Gibb's theorem with one example.   **7M**

(or)

3. a. Explain about binary classification problem, with an example. **7M**

   b. Discuss in detail about Naive Baye's classifier.   **8M**

UNIT-II

4. A dataset collected in a cosmetics shop showing details of customers and whether or not they responded to a special offer to buy a new lip-stick is shown in table below. Use this dataset to build a decision tree, with Buys as the target variable, to help in buying lip-sticks in the future.   **15M**

ID	Age	Income	Gender	Marital Status	Buys
1	< 21	High	Male	Single	No
2	< 21	High	Male	Married	No
3	21-35	High	Male	Single	Yes
4	>35	Medium	Male	Single	Yes
5	>35	Low	Female	Single	Yes
6	>35	Low	Female	Married	No
7	21-35	Low	Female	Married	Yes
8	< 21	Medium	Male	Single	No
9	<21	Low	Female	Married	Yes
10	> 35	Medium	Female	Single	Yes
11	< 21	Medium	Female	Married	Yes
12	21-35	Medium	Male	Married	Yes
13	21-35	High	Female	Single	Yes
14	> 35	Medium	Male	Married	No

(or)

5. a. Elaborate on various multi class classification algorithms.   **7M**

   b. Discuss about descriptive learning.   **8M**

UNIT-III

6. a. Explain about various SVM Kernels.   **8M**

   b. Elaborate on multivariate linear regression with an example. **7M**

(or)

7. a. What is clustering? Discuss about k-means clustering algorithm.

   8M

   b. Discuss about KNN algorithm with an example.   **7M**

UNIT-IV

8. a. Discuss in detail about Backpropagation algorithm.   **10M**

   b. How neural networks are useful for doing supervised learning? **5M**

(or)

9. a. Develop an algorithm for stacking the blocks into a single stack that spells the word "universal".   **8M**

   b. Discuss in detail about crossover techniques in genetic algorithm.   **7M**

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Reg. No:

VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)
IV/IV B.Tech. DEGREE EXAMINATION, MARCH, 2018

Seventh Semester

INFORMATION TECHNOLOGY

14IT3702 MACHINE LEARNING

Time: 3 hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. Outline any two issues of Machine Learning

b. Define the inductive learning hypothesis.

c. Explain about single point crossover operation.

d. Model the program tree representation in genetic programming.

e. Outline the characteristics of Backpropagation algorithm.

f. List the features of Bayesian learning method.

g. Define Baye's theorem.

h. Illustrate Naïve Baye's Classifier.

i. Determine the formula for Euclidean distance between two features.

j. Define locally weighted linear regression.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Analyze the features of inductive bias method. **10M**

    b. Explain List-Then-Eliminate algorithm with an example. **5M**

(or)

3. a. Illustrate about the issues in decision tree learning algorithm. **8M**

    b. Discuss about the successful applications of machine leaning with examples. **7M**

UNIT-II

4. a. Illustrate about advanced topics in Artificial Neural Networks. **8M**

    b. Explain about face recognition application by using Back propagation algorithm. **7M**

(or)

5. a. Illustrate about genetic programming, representation and remarks. **10M**

    b. List and explain the features of hypothesis space search. **5M**

UNIT-III

6. a. Outline Baye's theorem with an example. **10M**

    b. Demonstrate about Gibb's algorithm. **5M**

(or)

7. a. Distinguish about EM algorithm with an example. **8M**

    b. Explain about Maximum likelihood hypotheses for predicting probabilities. **7M**

UNIT-IV

8. a. Illustrate about Case Based reasoning with an example. **10M**

    b. Explain about distance-weighted nearest neighbor algorithm. **5M**

(or)

9. a. Discuss about terminology used in regression techniques. **8M**

    b. Explain about k-Nearest Neighbor algorithm with an example. **7M**

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VR14

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VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, APRIL, 2019

Seventh Semester

INFORMATION TECHNOLOGY

14IT3702 MACHINE LEARNING

Time: 3hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part-B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. Compare inductive and deductive learning task.

    b. What is machine learning?

    c. How can you avoid overfitting?

    d. What is perceptron?

    e. What are Bayesian networks?

    f. Why instance based learning algorithm sometimes referred as Lazy learning algorithm?

    g. Why is naive Bayes so 'naive'?

    h. What is replication in genetic algorithms?

    i. Compare lazy and eager learning.

    j. Define kernel.

PART-B

4 x 15 = 60M

UNIT-I

2. a. What are the issues in Decision tree learning? How they are overcome? **8M**

   b. Discuss different important applications of machine learning. **7M**

(or)

3. Consider the following set of training example: **15M**

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

   a. What is the entropy of this collection of training example with respect to the target function classification?

   b. What is the information gain of a2 relative to these training examples?

UNIT-II

4. a. Consider a multilayer feed forward neural network. Enumerate and explain steps in Back propagation algorithm use to train network. **10M**

   b. Discuss in detail about genetic programming. **5M**

(or)

5. a. What are the expressive capabilities of ANN? **8M**

   b. Discuss about Genetic algorithm in brief. **7M**

UNIT-III

6. a. Define true error. Explain the error of a hypothesis. **7M**

   b. What are Bayesian belief networks? Where are they used? Can it solve all types of problems? **8M**

(or)

7. a. Describe EM algorithm. **8M**

   b. Discuss in brief about Gibbs algorithm. **7M**

UNIT-IV

8. a. Enumerate the steps in k-NN clustering algorithm. **7M**

   b. Explain radial basis function with an example. **8M**

(or)

9. a. Briefly explain locally weighted regression. **7M**

   b. Explain the methods of choosing an appropriate kernel function. **8M**

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VR14

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VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, OCTOBER, 2020

Seventh Semester

INFORMATION TECHNOLOGY

<u>14IT3702 MACHINE LEARNING</u>

Time: 3 hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1.   a.   Show the final design of the checkers learning program.

b.   List any three issues in Machine Learning.

c.   Define version space.

d.   What is the purpose of backpropagation algorithm?

e.   List the set of functions that can be represented by feedforward networks.

f.   What is the posterior probability of Bayes theorem?

g.   Represent Bayes optimal classification.

h.   Define Gibbs algorithm.

i.   List any two disadvantages of instance-based approaches.

j.   List the three key properties shared by k-nearest neighbor.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Discuss about various disciplines and examples that influence on machine learning.   **7M**

    b. Discuss *LIST-THEN-ELIMINATE* Algorithm and compact representation for version Spaces.   **8M**

(or)

3. a. Demonstrate the futility of bias-free learning for inductive bias.   **9M**

    b. Demonstrate hypothesis space search in decision tree learning.   **6M**

UNIT-II

4. a. Discuss about appropriate problems for neural network learning.   **6M**

    b. Illustrate gradient descent and the delta rule for Perceptrons. **9M**

(or)

5. a. Summarize alternative error functions and alternative error minimization procedures for artificial neural networks.   **7M**

    b. How genetic algorithms search a space for candidate hypotheses to identify the best hypothesis?   **8M**

UNIT-III

6. a. Illustrate Brute-Force bayes concept learning.   **7M**

    b. Summarize maximum likelihood and least-squared error hypotheses.   **8M**

(or)

7. a. Describe Bayesian belief network as probability distribution governing a set of variables by specifying a set of conditional independence assumptions along with a set of conditional probabilities.   **10M**

    b. Discuss how to estimate the means of k Gaussians for EM algorithm?   **5M**

UNIT-IV

8. a. Illustrate Locally weighted regression.   **7M**

    b. Elaborate Distance-weighted nearest neighbor algorithm.   **8M**

(or)

9. a. Elaborate the radial basis function with an example.   **7M**

    b. How case based reasoning instances are typically represented using symbolic descriptions and the methods used to retrieve similar instances?   **8M**

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VR14

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VELAGAPUDI RAMAKRISHNA
SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, OCTOBER, 2017
Seventh Semester

INFORMATION TECHNOLOGY

14IT3702 MACHINE LEARNING

Time: 3 hours   *Max. Marks : 70*

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a.   What is List-Then-Eliminate algorithm?

    b.   List any two successful applications of machine learning.

    c.   Which attribute is the best classifier?

    d.   Define perception.

    e.   What are genetic operators?

    f.   Justify the term ANN.

    g.   Define Bayes optimal classifier.

    h.   Compare consistent learner with concept learner.

    i.   What is radial basis functions?

    j.   Define case-based reasoning.

PART-B

4 x 15 = 60M

UNIT-I

2. a. Analyze the steps of candidate elimination algorithm using version spaces. **8M**

    b. Explain about well-posed learning problems. **7M**

    (or)

3. a. Explain the process of selecting best attribute in ID3 algorithm. **8M**

    b. Discuss about appropriate problems for decision tree learning. **7M**

UNIT-II

4. a. Illustrate about appropriate problems for neural network learning system. **7M**

    b. Outline the features of back-propagation algorithm with an example application. **8M**

    (or)

5. a. Illustrate about genetic algorithm, representation, operators with examples. **10M**

    b. What is fitness function and selection? Explain with an example. **5M**

UNIT-III

6. a. Outline the features of Naïve Bayes classifier with an example. **10M**

    b. Demonstrate about minimum description length principle. **5M**

    (or)

7. a. Elaborate about Bayesian belief networks with an example. **10M**

    b. Explain about Bayes optimal classifier. **5M**

UNIT-IV

8. a. Illustrate about k-nearest neighbor learning algorithm. **8M**

    b. Explain the features of locally weighted regression technique. **7M**

    (or)

9. a. Determine the features of about radial basis functions. **8M**

    b. Compare lazy and eager learning concepts. **7M**

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VELAGAPUDI RAMAKRISHNA

SIDDHARTHA ENGINEERING COLLEGE

(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2018

Seventh Semester

INFORMATION TECHNOLOGY

<u>14IT3702 MACHINE LEARNING</u>

Time: 3hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part-B

Answer to any single question or its part shall be written at one place only

<u>PART-A</u>

10 x 1 = 10M

1.   a.   Compare direct and indirect training experience.

    b.   Define version space.

    c.   What's the trade-off between bias and variance?

    d.   How is the k-nearest neighbor algorithm different from k-means clustering?

    e.   Define posterior probability.

    f.   What is pruning?

    g.   What is 'overfitting' in machine learning?

    h.   What are the three stages to build the hypotheses or model in machine learning?

    i.   What are the advantages of Naive Bayes?

    j.   What is genetic pogramming?

PART-B

4 x 15 = 60M

UNIT-I

2. Implement the candidate elimination algorithm for the following dataset. **15M**

Origin	Manufacturer	Color	Decade	Type	Example Type
Japan	Honda	Blue	1980	Economy	Positive
Japan	Toyota	Green	1970	Sports	Negative
Japan	Toyota	Blue	1990	Economy	Positive
USA	Chrysler	Red	1980	Economy	Negative
Japan	Honda	White	1980	Economy	Positive
Japan	Toyota	Green	1980	Economy	Positive
Japan	Honda	Red	1990	Economy	Negative

(or)

3. a. What is the procedure to build decision tree using ID3 algorithm. Illustrate with example. **8M**

b. Elaborate issues in decision tree learning. **7M**

UNIT-II

4. a. Explain how back propagation algorithm works for multilayer feed forward network? **10M**

b. Describe the significance of cross-over and mutation operations in genetic algorithm. **5M**

(or)

5. a. What is linearly inseparable problem? Design a two layer network of perceptron to implement A XOR B. **7M**

b. Discuss about the procedure to recognize face using machine learning techniques. **8M**

UNIT-III

6. a. Explain Bayesian belief network and conditional independence with example. **9M**

b. Discuss about minimum description length principle. **6M**

(or)

7. a. Explain Brute force bayes concent learning with an example. **8M**

b. Describe in brief about EM algorithm. **7M**

UNIT-IV

8. a. Describe k-nearest neighbor algorithm. Why is it called instance based learning? **7M**

b. Explain in brief about case based reasoning. **8M**

(or)

9. a. Give a short note on distance weighted nearest neighbor algorithm. **7M**

b. Briefly explain locally weighted regression. **8M**

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SIDDHARTHA ENGINEERING COLLEGE
(AUTONOMOUS)

IV/IV B.Tech. DEGREE EXAMINATION, NOVEMBER, 2019
Seventh Semester

INFORMATION TECHNOLOGY

<u>14IT3702 MACHINE LEARNING</u>

Time: 3 hours   *Max. Marks: 70*

Part-A is compulsory

Answer One Question from each Unit of Part - B

Answer to any single question or its part shall be written at one place only

PART-A

10 x 1 = 10M

1. a. List the three features of well-defined learning problem.

    b. Relate inductive learning hypothesis for concept learning task.

    c. What is for FIND-S algorithm?

    d. What is the biological motivation for artificial neural networks?

    e. What is sigmoid threshold unit?

    f. Why Baye's theorem is considered as cornerstone for Bayesian learning methods?

    g. Represent minimum description length principle.

    h. What is the difference between Naive Bayes learning method and other learning methods?

    i. Why instance-based methods are sometimes referred to as 'lazy' learning methods?

    j. How instance-based learning methods differ from other approaches to function approximation?

PART-B

4 x 15 = 60M

UNIT-I

2. a. Discuss about any four successful applications of machine learning.   **7M**

    b. Explain remarks on version spaces and candidate-elimination with reference to convergence and partially learned concepts.   **8M**

(or)

3. a. Briefly discuss about design issues in machine learning.   **10M**

    b. Show decision tree representation and list appropriate problems for decision tree learning.   **5M**

UNIT-II

4. a. Discuss about representational power of perceptrons and training rule.   **8M**

    b. Elaborate the derivation of the backpropagation rule.   **7M**

(or)

5. a. Describe how face recognition is performed in terms of task and design choices?   **7M**

    b. Demonstrate genetic programming with an example.   **8M**

UNIT-III

6. a. Summarize maximum likelihood hypotheses for predicting probabilities.   **8M**

    b. Illustrate Naive Bayes classifier, with an example.   **7M**

(or)

7. a. How Bayesian belief networks allow stating conditional independence assumptions that apply to subsets of the variables?   **9M**

    b. Derive k means algorithm.   **6M**

UNIT-IV

8. a. Illustrate k-nearest neighbor algorithm.   **9M**

    b. Discuss about locally weighted linear regression.   **6M**

(or)

9. a. Elaborate on case-based reasoning.   **7M**

    b. How radial basis functions is closely related to distance-weighted regression and also to artificial neural networks?   **8M**

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