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**Department of Computer Science & Engineering**

QUESTION BANK

Sem/Subject/Code: 7th/ML/15CS73

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**MODULE-I**

1. Define machine learning and discuss various issues in machine learning.
2. Explain the steps in designing a learning system.
3. Describe the find-s algorithm and explain its working by taking some dataset.
4. Write the algorithm for candidate elimination
5. Explain the applications of machine learning.
6. What is ML? Explain how supervised learning is different from unsupervised learning.
7. Write a note inductive bias.
8. Illustrate with suitable example the candidate elimination algorithm.

9. Define the following terms:

a. Learning

b. LMS weight update rule

c. Version Space

d. Consistent Hypothesis

e. General Boundary

f. Specific Boundary

g. Concept

10.What are the important objectives of machine learning?

11.How is Candidate Elimination algorithm different from Find-S Algorithm

12.How do you design a checkers learning problem

13. **practice problems on Find-s and candidate elimination alg**

**MODULE-II**

1. Define decision tree, entropy and information gain.
2. Define entropy and information gain and describe the ID3 algorithm for decision tree learning.
3. When to use Decision tree? (problem characteristics)
4. Write a note on inductive bias in decision tree learning
5. Explain the issues in decision tree learning.
6. Differentiate between restriction bias and preference bias.
7. Discuss Entropy in ID3 algorithm with an example
8. Compare Entropy and Information Gain in ID3 with an example.
9. Describe hypothesis Space search in ID3 and contrast it with Candidate-Elimination algorithm.
10. List the issues in Decision Tree Learning. Interpret the algorithm with respect to

Overfitting the data

1. Write the steps of ID3Algorithm
2. Explain the various issues in Decision tree Learning
3. What are the alternative measures for selecting attributes?
4. **Practice problems on Decision tree**

**MODULE-III**

1. Define artificial neural network (ANN).
2. What are the appropriate problem for neural network learning (OR) explain the appropriate problems to neural network learning and characteristics?
3. Write a note on neural network representation.
4. Define perceptron and how do you represent perceptron?
5. What are the different algorithms to solve learning problem? (OR) write a note on perceptron rule and delta rule.
6. Derive the gradient descent rule. (OR) explain the stochastic approximation to gradient descent of back propagation algorithm.
7. Write the algorithm for gradient descent.
8. Explain back propagation algorithm in detail.
9. Derive back propagation rule.
10. What are activation functions? Explain different types of activation functions.
11. Write a note on
12. Perceptron rule.
13. Gradient descent and delta rule.
14. Write a note on remarks on the back-propagation algorithm.
15. List the advantages and limitations of back propagation algorithm.
16. What do you mean by Gradient Descent?
17. Derive the Gradient Descent Rule.

**MODULE-IV**

1) Explain the concept of Bayes theorem with an example.

2) Explain Bayesian belief network and conditional independence with example.

3) What are Bayesian Belief nets? Where are they used?

4) Explain Brute force MAP hypothesis learner? What is minimum description length

Principle

5) Explain the k-Means Algorithm with an example.

6) How do you classify text using Bayes Theorem

7) Define (i) Prior Probability (ii) Conditional Probability (iii) Posterior Probability

8) Explain Brute force Bayes Concept Learning

9) Explain the concept of EM Algorithm.

10)What is conditional Independence?

11) Explain Naïve Bayes Classifier with an Example.

12)Describe the concept of MDL.

13)Who are Consistent Learners.

14)Discuss Maximum Likelihood and Least Square Error Hypothesis.

15)Describe Maximum Likelihood Hypothesis for predicting probabilities.

16) Explain the Gradient Search to Maximize Likelihood in a neural Net.

17. **practice problems on bayes netwotk**

**MODULE-V**

1. What is Reinforcement Learning?

2. Explain the Q function and Q Learning Algorithm.

3. Describe K-nearest Neighbour learning Algorithm for continues valued target function.

4. Discuss the major drawbacks of K-nearest Neighbour learning Algorithm and how it can

be corrected

5. Define the following terms with respect to K - Nearest Neighbour Learning:

i) Regression ii) Residual iii) Kernel Function.

6.Explain Q learning algorithm assuming deterministic rewards and actions?

7. Explain Locally Weighted Linear Regression.

8.Define the following terms

a. Sample error b. True error c. Random Variable

d. Expected value e. Variance f. standard Deviation

9. Explain Binomial Distribution with an example.

10. Explain Normal or Gaussian distribution with an example.

11.Explain the Central Limit Theorem with an example.

12. Write the Procedure for estimating the difference in error between two learning methods.

Approximate confidence intervals for this estimate

