S

**QUESTION BANK WITH BLOOMS TAXONOMY LEVEL (BTL)**

(1. Remembering 2. Understanding 3. Applying 4. Analyzing 5. Evaluating 5. Creating)

|  |  |  |  |
| --- | --- | --- | --- |
| **UNIT-1 Machine Learning** | | | |
| **1 MARKS QUESTIONS** | | **BT Level** | **Course**  **Outcome** |
| 1. | Define Machine Learning.? | I | CO1 |
| 2. | Discuss applications of ML? | VI | CO1 |
| 3. | What is well- posed learning problems.? | I | CO1 |
| 4.. | Explain the steps in designing a learning systems in detail.? | II | CO1 |
| 5. | Explain different perspective and issues in machine learning.? | II | CO1 |
| 6. | Define concept learning task? | I | CO1 |
| 7. | Explain the General-to-Specific Ordering of Hypotheses?`` | II | CO1 |
| 8 | Define Consistent Hypothesis ? | I | CO1 |
| 9 | DefineVersion Space.? | I | CO1 |
| 10 | Write LIST-THEN-ELIMINATE algorithm. | II | CO1 |
| **10 MARKS QUESTIONS** | | | |
| 1. | Define Machine Learning. Explain with examples why machine learning isimportant | I | CO1 |
| 2. | .Describe the following problems with respect to Tasks, Performance and Experience:  a.A Checkers learning problem  b.A Handwritten recognition learning problem  c.A Robot driving learning problem | II | CO1 |
| 3. | Write FIND-S algorithm and explain with example given below   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Example** | **Sky** | **AirTemp** | **Humidity** | **Wind** | **Water** | **Forecast** | **EnjoySport** | | **1** | Sunny | Warm | Normal | Strong | Warm | Same | Yes | | **2** | Sunny | Warm | High | Strong | Warm | Same | Yes | | **3** | Rainy | Cold | High | Strong | Warm | Change | No | | **4** | Sunny | Warm | High | Strong | Cool | Change | Yes | | *II* | CO1 |
| 4. | Write the final version space for the below mentioned training examples using candidate elimination algorithm.   |  |  |  |  | | --- | --- | --- | --- | | **Size** | **Color** | **Shape** | **Class** | | Big | Red | Circle | No | | Small | Red | Triangle | No | | Small | Red | Circle | Yes | | Big | Blue | Circle | No | | Small | Blue | Circle | Yes |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **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 | | II | CO1 |
| 5. | Explain in detail the Inductive Bias of Candidate Elimination algorithm. | II | CO1 |
| 6. | Define Consistent Hypothesis and Version Space. | I | CO1 |
| 7**.** | Define concept learning and discuss with example. | I | CO1 |
| 8 | Explain the steps in designing a learning systems indetail. | II | CO1 |
| 9 | What is well- posed learningproblems.explain with example. | I | CO1 |
| 10 | Remarks on version spaces and candidate elimination algorithm? | I | CO1 |
| **Unit -II : DECISION TREE LEARNING** | | | |
| **1 MARKS QUESTIONS** | | | |
| 1. | What is decision tree and decision tree learning? | I | CO2 |
| 2. | What are appropriate problems for Decision tree learning? | I | CO2 |
| 3. | What is overfiting of data? | VI | CO2 |
| 4. | What are issues in learning decision trees | I | CO2 |
| 5. | What is perceptron? | VI | CO2 |
| 6. | What is Artificial Neural Network? | I | CO2 |
| 7. | What is linear and non-linear seperable of data? | VI | CO2 |
| 8 | Derive the Gradient Descent Rule | II | CO2 |
| 9 | Write Gradient Descent algorithm for training a linear unit. | VI | CO2 |
| 10 | Derive the Back Propagation Rule | II | CO2 |
| **10 MARKS QUESTIONS** | | | |
| 1 | Explain the Back Propagation algorithm? | II | CO2 |
| 2. | Issues in Decision Tree Learning? | II | CO2 |
| 3. | Write a note on (i) Perceptron Training Rule (ii) Gradient Descent and Delta Rule | VI | CO2 |
| 4. | How a single perceptron can be used to represent the Boolean functions such as AND,OR | I | CO2 |
| 5. | Design a two-input perceptron that implements the boolean function A Λ ¬ B. Design atwo-layer network of perceptron’s that implements A XOR B. | VI | CO2 |
| 6 | Give Decision trees for the following set of training examples   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Day** | **Outlook** | **Temperature** | **Humidity** | **Wind** | **PlayTennis** | | D1 | Sunny | Hot | High | Weak | No | | D2 | Sunny | Hot | High | Strong | No | | D3 | Overcast | Hot | High | Weak | Yes | | D4 | Rain | Mild | High | Weak | Yes | | 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 | | VI | CO2 |
| 7 | Consider the following set of training examples.  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?   |  |  |  |  | | --- | --- | --- | --- | | Instance | Classification | a1 | a2 | | 1 | + | T | T | | 2 | + | T | T | | 3 | - | T | F | | 4 | + | F | F | | 5 | - | F | T | | 6 | - | F | T | | III | CO2 |
| 8 | Explain backpropagation algorithm with an example? | VI | CO2 |
| 9 | What are Restriction Biases and Preference Biases and differentiate between them. | I | CO2 |
| 10 | Discuss Inductive Bias in Decision Tree Learning. | II | CO2 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| 10 |  | II | CO2 |
|  | | | |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| 6. |  |  |  |
| 7. |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |
| 10 |  |  |  |
|  | | | |
| **Unit – III : BAYESIAN LEARNING** | | | |
| **1 MARKS QUESTIONS** | | | |
| 1. | Define Bayesian theorem? | I | CO3 |
| 2. | Explain the practical difficulties of Bayesian theorem. | II | CO3 |
| 3 | What are Consistent Learners? | I | CO3 |
| 4. | Explain Brute force Bayes Concept Learning | II | CO3 |
| 5 | Describe the concept of MDL. | II | CO3 |
| 6. | Explain the concept of EM Algorithm | II | CO4 |
| 7 | Explain Binomial Distribution with an example. | II | CO4 |
| 8. | What are instance based learning? | I | CO4 |
| 9. | Define the following terms with respect to K - Nearest Neighbour Learning | I | CO4 |
| 10. | Explain radial basis function | II | CO4 |
| **10 MARK QUESTION** | | | |
| 1. | Write about bayes optimal classifier | I | CO3 |
| 2 | Define Bayesian theorem? What is the relevance and features of Bayesian theorem? Explain the practical difficulties of Bayesian theorem. | I | CO3 |
| 3. | Define is Maximum a Posteriori (MAP) Maximum Likelihood (ML) Hypothesis. Derive the relation for hMAP and hML using Bayesian theorem. | II | CO3 |
| 4 | What is gibbs Algorithm ? Naïve bayes classifier? | I | CO3 |
| 5. | What is weighted majority algorithm? | I | CO3 |
| 6 | Explain the concept of EM Algorithm. Discuss what are Gaussian Mixtures | II | CO4 |
| 7. | Describe the concept of MDL. Obtain the equation for hMDL | II | CO4 |
| 8. | K-Nearest Neighbouring algorithm? | VI | CO4 |
| 9 | What is genetic algorithm? How to parallelizing genetic algorithms. | II | CO4 |
| 10 | Write about case based reasoning? | II | CO4 |

|  |  |  |  |
| --- | --- | --- | --- |
| **Unit-IV: Learning Sets of Rules** | | | |
| **1 MARKS QUESTIONS** | | | |
| 1. | What are the Learning Sets of Rules? | III | CO5 |
| 2. | Explain about Sequential covering algorithm? | II | CO5 |
| 3. | Describe Learn-One-Rule? | I | CO5 |
| 4. | Write Learning First-Order Rules? | III | CO5 |
| 5. | What are the Specializing Rules in FOIL? | III | CO5 |
| 6. | Defined inverted Induction? | I | CO5 |
| 7. | Defined inverted Ddeduction? | II | CO5 |
| 8 | Explain Learning First-Order Rules? | II | CO5 |
| 9 | Defined PROGOL | I | CO5 |
| 10 | Defined CIGOL? | I | CO5 |
| **10 MARK QUESTIONS** | | | |
| 1. | Discus about PROGOL ? | I | CO5 |
| 2. | Describe in details of  **Inverting Resolution?** | I | CO5 |
| 3. | Explain details of Learning Sets of Rules? | II | CO5 |
| 4. | Write the Sequential Covering Algorithm? With examample. | III | CO5 |
| 5. | Describe First Order Rule for Classifying Web Pages. | I | CO5 |
| 6. | Discus about PROGOL ? | I | CO5 |
| 7. | Defend Induction as Inverted Deduction . | V | CO5 |
| 8 | What are the Deduction Resolution Rule. | III | CO5 |
| 9 | Classify the First order resolution. | II | CO5 |
| 10 | Write the Sequential Covering Algorithm .Demonstrate the whether forcasting example.?   |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | | **Day** | **Outlook** | **Temperature** | **Humidity** | **Wind** | **PlayTennis** | | D1 | Sunny | Hot | High | Weak | No | | D2 | Sunny | Hot | High | Strong | No | | D3 | Overcast | Hot | High | Weak | Yes | | D4 | Rain | Mild | High | Weak | Yes | | 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 | | III | CO5 |

|  |  |  |  |
| --- | --- | --- | --- |
| **V-Combining Inductive and Analytical Learning** | | | |
| **1 MARKS QUESTIONS** | | | |
| 1. | Defind Combining Inductive and Analytical Learning? | I | CO6 |
| 2. | Defferentiate the Inductive and Analytical Learning? | IV | CO6 |
| 3. | Defind Domain Theory? | I | CO6 |
| 4. | Describe KBANN? | II | CO6 |
| 5. | Defind Hypothesis Space. | I | CO6 |
| 6. | Describe EBNN. | II | CO6 |
| 7. | Demonstrate TangetProp. | III | CO6 |
| 8 | Describe FOCL. | I | CO6 |
| 9 | Discus Reinforcement Learning | I | CO6 |
| 10 | Describe the Using Prior Knowledge to Augment Search Operators | I | CO6 |
| 10 MARK QUESTIONS | | | |
| 1. | Discuss the FOCL Algorithm in detail. | II | CO6 |
| 2. | Memorize the Domain Theory.give a traning example. | I | CO6 |
| 3. | Discuss Combining Inductive and Analytical Learning in detail. explain motivation. | II | CO6 |
| 4 | Implement the Neural Net Equivalent to Domain Theory | III | CO6 |
| 5. | Explain Motivation Inductive-Analytical Approaches to Learning | II | CO6 |
| 6. | Discuss the EBNN Algorithm | II | CO6 |
| 7. | Discuss the TangentProp Algorithm. n Illustrative Example | II | CO6 |
| 8 | Explain KBANN Algorithm.Give an Example | II | CO6 |
| 9 | Discuss about Hypothesis Space Search.Demonstrate the Using Prior Knowledge to Initialise the Hypothesis | II | CO6 |
| 10 | What is nthe Motivation.Explain Motivation Inductive-Analytical Approaches to Learning | III | CO6 |