MACHINE LEARNING QUESTION BANK

1. Define machine learning. Discuss with examples some applications of machine learning.
2. What do you mean by well posed learning problem? Explain Important features that are required to define well posed learning problems.
3. Describe briefly the steps involved in designing a learning system.
4. Discuss the concept of learning as the task of searching with respect to the general to specific ordering of hypothesis.
5. Illustrate Find S algorithm over the Enjoy Sport training instances given.

Example	Sky	AirTemp	Humidity	Wind	Water	Forecast	Enjoy Sport
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

6. Define consistent hypothesis and version space .With example data(Qn. No 5) discuss version space and trace candidate elimination algorithm .
7. Explain the candidate elimination learning algorithm
8. Consider the given below training example which finds Malignant tumours from the MRI Scans.

Exampie	Shape	Size	Color	Surface	Thickness	Target concept
1	Circular	Large	Light	Smooth	Thick	Malignant
2	Circular	Large	Light	Irregular	Thick	Malignant
3	Oval	Large	Dark	Smooth	Thin	Benign
4	Oval	Large	Light	Irregular	Thick	Malignant
5	Circular	Small	Light	Smooth	Thick	Benign

Show the specific and general boundaries of the version space after applying candidate elimination algorithm. (Note: Malignant is +ve , Benign is -ve).

9. Describe ID3 algorithm. Calculate entropy and information gain of A2 for the following dataset.

Instance	Classification	A1	A2
1	+	T	T
2	+	T	T
3	-	T	F
4	+	F	F
5	-	F	T
6	-	F	T

10. Describe inductive bias in decision tree learning
11. What is linearly inseparable problem. Design a network of perceptron to implement X AND Y.
12. What is Perceptron? Discuss Perceptron training rule.
13. What do you mean by Gradient descent? What are the conditions in which Gradient descent is applied?
14. Explain the importance of Stochastic Gradient descent.
15. Write the Back propagation algorithm for feedforward network with two layers of Sigmoid units.