**ML Question Bank**

**Not Unit wise**

1. Explain the structure of Decision Tree, what are the diff types of nodes in decision tree (4M)
2. Varieties in DT (3M)
3. Compare the diff DT algos (4M)
4. Adv and Disadvantages of DT (3M)
5. How entropy, IG are used to determine a root node of a decision tree (5M) (No need to do mathematical cals, theory will do)
6. How Gini are used to determine a root node of a decision tree (5M) (No need to do mathematical cals, theory will do)
7. Derive Naive Bayes classifier from Bayes Theorem (4M or 5M)
8. Features of Naive Bayes (3M)
9. How training and testing of Discrete Naive Bayes is done (5M)(No need to do mathematical cals, theory will do)
10. How training and testing of continuous naive bayes is done (5M)
11. Compare DL and ML (3M)
12. What are the dif types of deep neural networks with applications (4M)
13. Write backpropagation algorithm (mostly only forward phase) (4M)
14. What are the loss functions for classification (5M)
15. Loss functions for regression (4M)
16. Types of gradient descent (4M)
17. Write gradient descent algorithm (5M)
18. Explain the terms evolutionary computation and evolutionary algo (3M)
19. What are the diff types of encoding schemes in genetic algo, explain with example (4M)
20. Explain with example, cross over techniques in binary encoding. (5M)
21. Explain with example, cross over techniques in permutation encoding (4M)
22. Advantages, dis and applications for genetic algo (3M, can be in combo as well)
23. Explain with eg generative classifier (4M)
24. Explain with ex discriminative classifier (4M)
25. Compare generative classifier and discriminative classifier (3M)
26. Compare GMM with Kmeans (3M)
27. Explain the working of expectation maximization algorithm (5M)
28. What is GMM model? How is expectation maximzation algo used in GMM (4M)?
29. What is ensemble learning? Types of ensemble learning (3M)
30. What are the steps of Bagging (4M)
31. Steps for AdaBoost (4M)
32. Working of Stacking model for classification (5M)
33. Explain working of stacking model for regression (5M)
34. Different types of filtering techniques for making recommendation system. Explain each with an example. (4M) (collab and content)
35. What are the different approaches that can be used for collaborative filtering (4M)
36. What are the different approaches in memory based approach of collaborative filtering.(4M)
37. Explain with example how can we use cosine similarity score to find similar users and also to calculate the rating of similar users (5M)
38. Steps for genetic algorithms

Pattern recognition questions

1. Different approaches to pattern recognition (4M)
2. What is pattern recognition? Types in ML? (4M)

<https://www.geeksforgeeks.org/machine-learning/pattern-recognition-introduction/>

**Topic wise bifurcation for Theory:**

**Unit 1:**

* DT, Naive Bayes, Deep Neural Network

**Unit 2:**

* Generative Classifier, Discriminative classifier, collab filtering, content based filtering, Pattern recognition (Get from LLM, like rule based or distribution, boundary)

**Unit 3:**

* Genetic algo
* Gaussian mixture model
* Ensemble learning

**No deep learning prac in exam.**