# PRACTICE QUESTIONS

UNIT 1:

1. What is AI describe its significance in the today's era
2. Differentiate strog and WEAK AI w.r.t. applications or techniques
3. A brief history of AI (very rare to be asked but for you knowledge purpose)
4. Explain the Chinese room problem
5. Demonstrate the Turing test
6. Describe the steps involved in the AI starting from Knowledge representation to ML
7. Explain the Semantic nets and apply the same for: *A Ford is a type of car. Bob owns two cars. Bob parks his car at home. His house is in California, which is a state. Sacramento is the state capital of California. Cars drive on the freeway, such as Route 101 and Highway 81.*
8. What are Search trees, Draw the partial search tree for following traveling salemen problem (Here you can expect a questions similar to this problem like missionary and cannibal problem, instead of missionaries it can be some other names)
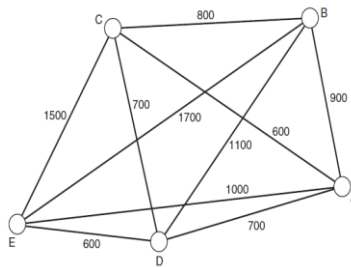
9. Prepare for the theoretical part of following concepts:
   Combinatorial Explosion, Problem reduction, Goal Trees, Combinatorial Explosion
10. Design a decision tree that enables you to identify an item from a category in which you are interested (e.g., cars, animals, pop singers, films, etc.).

UNIT 2:

1. Importance of Searching in AI / ML.
2. Data driven and goal driven Searches.
3. Differences in Generate and test with brute-force search (knowledge purpose)
4. Properties of Search Methods.
5. Algorithmic steps and its application to different graphs for DFS, BFS(DFS and BFS are in self learning but still I suggest prepare them well), DFID (7 to10 Marks question).
6. Search tree for MAZE problem.
7. Meaning of Heuristics and its application in AI.
8. Algorithmic steps and its application to Hill climbing, A*, Best first Search,
9. Explanation for concepts like Genetic Algorithms for search, Real time A*, Bidirectional search, Nondeterministic search, non-chronological backtracking
10. Explain the importance of local search in Combinatorial Optimization Problems.
11. Working of simulated annealing.
12. Explain how ant colony optimization works. Why might it be useful for communications routing?
13. Explain the purpose of the temperature variable in simulated annealing. How effective would the method be without it?
14. Investigate Tabu search.

<u>UNIT 4 SAMPLE QUESTIONS</u>

1. How learning happens in Machine learning

2. Explain the working of General-to-Specific Ordering with an example for the same (U can Expect some example with following types of data from text book):

<slow, wind, 30ft, 0, evening, cold>

<slow, rain, 20ft, 0, evening, warm>

<slow, snow, 30ft, 0, afternoon, cold>

Note: u can expect a question on find-s and candidate elimination for similar data as well. Find-s is discussed with an example in the class but find-s is not directly given in syllabus but is the part of candidate elimination. So prepare for that as well.

3. What are decision trees? Explain and apply ID3 algorithm for following data:
(U can expect some more questions of similar kind)

Film	Country of origin	Big star	Genre	Success
Film 1	United States	yes	Science Fiction	true
Film 2	United States	no	Comedy	false
Film 3	United States	yes	Comedy	true
Film 4	Europe	no	Comedy	true
Film 5	Europe	yes	Science fiction	false
Film 6	Europe	yes	Romance	false
Film 7	Rest of World	yes	Comedy	false
Film 8	Rest of World	no	Science fiction	false
Film 9	Europe	yes	Comedy	true
Film 10	United States	yes	Comedy	true

In the solution of such problems u have to give more importance on calculating the GAIN value. Remember do not forget to write the conclusion at the end of the solution.

4. Write the notes on following concepts:

Rote Learning, Learning Concepts, General-to-Specific Ordering, Version Spaces, Candidate Elimination, Inductive Bias, Decision-Tree Induction, The Problem of Overfitting, The Nearest Neighbor Algorithm, Learning Neural Networks, Reinforcement Learning.

5. Explain the types of activation functions useful in Neural Networks with examples.
6. Working of simple perceptron for OR,AND or Not gate etc.

Epoch	X1	X2	Expected Y	Actual Y	Error	w1	w2
1	0	0	0	0	0	−0.2	0.4
1	0	1	1	1	0	−0.2	0.4
1	1	0	1	0	1	0	0.4
1	1	1	1	1	0	0	0.4
2	0	0	0	0	0	0	0.4
2	0	1	1	1	0	0	0.4
2	1	0	1	0	1	0.2	0.4
2	1	1	1	1	0	0.2	0.4
3	0	0	0	0	0	0.2	0.4
3	0	1	1	1	0	0.2	0.4
3	1	0	1	1	0	0.2	0.4
3	1	1	1	1	0	0.2	0.4

7. Meaning of Multi layer PErceptron .
8. Back-propagation concept, working and improving its performance using 3 different ways.
9. Working of Recurrent NN and hop-field network.
10. Working of Evolving NN, K-map and Hebbian learning: Concept, Working.