UNIT 5: Unsupervised_Clustering_Reinforcement

1. "Reinforcement learning maps states or situations to actions in order to maximise some numerical reward". Justify this statement with appropriate examples of your choice.
2. Write and explain the k-means clustering algorithm. What are the four distance measures used by the classic k-means algorithm?
3. Write and explain the SOM Algorithm. Explain with proper example why does it fall under the category of *'competitive learning'* algorithms?
4. Cluster the dataset = { 2,3,4,10,11,12, 20, 25,30 } using k-means algorithm. We need to group into two clusters. Assume the initial centroids as 2 and 12.
5. Cluster the following eight data points A1(2,10), A2(2,5), A3(8,4), A4(5,8), A5(7,5), A6(6,4), A7(1,2), A8(4,9). Use k-means clustering with k = 3. Initial centroids are the data points A1, A4 and A7.
6. Answer the following:
   (i) How do you choose the value of 'k' in k-means algorithm?
   (ii) What are the stopping criterion of k-means algorithm.
7. Explain the following terms with appropriate examples:
   (i) Hierarchical Clustering
   (ii) Mixture Densities