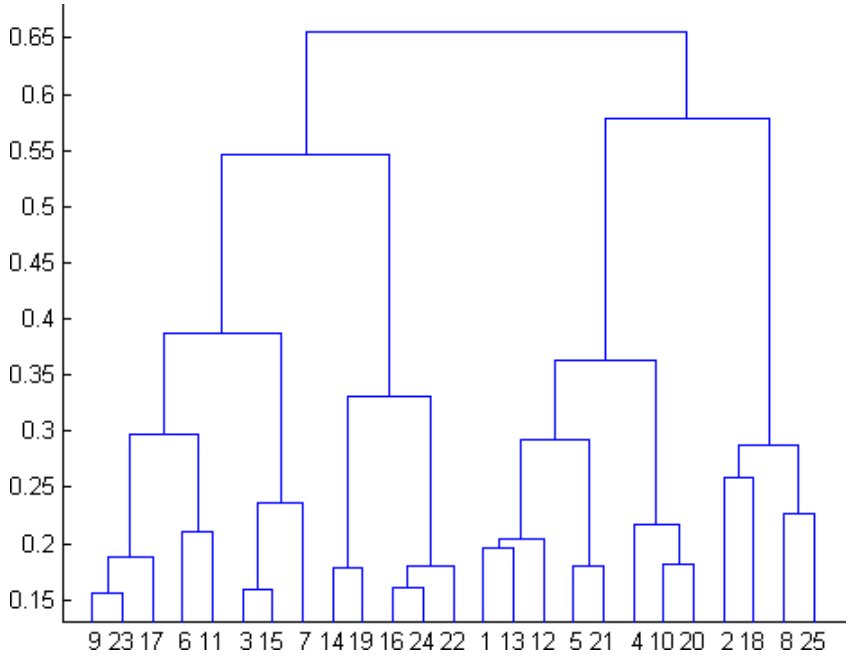
# MACHINE LEARNING

**Q1 to Q12 have only one correct answer. Choose the correct option to answer your question.**

1. What is the most appropriate no. of clusters for the data points represented by the following dendrogram:




a)2
b)4
c)6
d)8



Ans :- b) 4

2. In which of the following cases will K-Means clustering fail to give good results?
   1. Data points with outliers
   2. Data points with different densities
   3. Data points with round shapes
   4. Data points with non-convex shapes

   Options:

   a) 1 and 2
   b) 2 and 3

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c) 2 and 4
d) 1, 2 and 4

Ans :- d) 1, 2 and 4

3. The most important part of____is selecting the variables on which clustering is based.
   a) interpreting and profiling clusters
   b) selecting a clustering procedure
   c) assessing the validity of clustering
   d) formulating the clustering problem

Ans :- d) formulating the clustering problem

4. The most commonly used measure of similarity is the____or its square.
   a) Euclidean distance
   b) city-block distance
   c) Chebyshev's distance
   d) Manhattan distance

Ans :- a)Euclidean distance

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5. ---------- is a clustering procedure where all objects start out in one giant cluster. Clusters are formed by dividing this cluster into smaller and smaller clusters
   a) Non-hierarchical clustering
   b) Divisive clustering
   c) Agglomerative clustering
   d) K-means clustering

Ans :- b) Divisive clustering

6. Which of the following is required by K-means clustering?
   a) Defined distance metric
   b) Number of clusters
   c) Initial guess as to cluster centroids
   d) All answers are correct

Ans :- d) All answers are correct

7. The goal of clustering is to-
   a) Divide the data points into groups
   b) Classify the data point into different classes
   c) Predict the output values of input data points
   d) All of the above

Ans :- a) Divide the data points into groups

8. Clustering is a-
   a) Supervised learning
   b) Unsupervised learning
   c) Reinforcement learning
   d) None

Ans :- b) Unsupervised learning

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9. Which of the following clustering algorithms suffers from the problem of convergence at local optima?
    a) K- Means clustering
    b) Hierarchical clustering
    c) Diverse clustering
    d) All of the above



Ans :- d) All of the above

10. Which version of the clustering algorithm is most sensitive to outliers?
    a) K-means clustering algorithm
    b) K-modes clustering algorithm
    c) K-medians clustering algorithm
    d) None

Ans :- a) K-means clustering algorithm

11. Which of the following is a bad characteristic of a dataset for clustering analysis-
    a) Data points with outliers
    b) Data points with different densities
    c) Data points with non-convex shapes
    d) All of the above

Ans :- d) All of the above

12. For clustering, we do not require-
    a) Labeled data
    b) Unlabeled data
    c) Numerical data
    d) Categorical data

Ans :- a) Labeled data

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**Q13 to Q15 are subjective answers type questions, Answers them in their own words briefly.**

13. How is cluster analysis calculated?

Ans:- This is calculated as the sum of squared distances between data points and the centers of the clusters they belong to. Inertia quantifies the within-cluster variation. Another popular metric is the silhouette coefficient, which attempts to summarize both within-cluster and between-cluster variation.

14. How is cluster quality measured?

Ans:- To measure the quality of a clustering, we can use the average silhouette coefficient value of all objects in the data set.

15. What is cluster analysis and its types?

Ans:- Agglomerative clustering starts with single objects and starts grouping them into clusters. The divisive method is another kind of Hierarchical method in which clustering starts with the complete data set and then starts dividing into partitions.