

**COMSATS University Islamabad, Lahore Campus**  
**Department of Electrical and Computer Engineering**  
**M. A. Jinnah Campus, Lahore.**

**CSC462 – Artificial Intelligence**

**FA22-BCE Spring 2025**

**Total Marks 20**

**Friday 16 May 2025**

**Assignment 4**

**Resource Person:** Dr. Muhammad Farooq-i-Azam

**Submission Deadline:** Thursday 22 May 2025

**Problem** **(20)**

Before using a clustering algorithm, such as k-means clustering to group the data into clusters, the number of clusters in the dataset must be estimated. There are a number of methods which can be used for this purpose, such as, the following three:

1. Elbow method
2. Silhouette Score
3. Gap Statistic

Explain each of these three methods in detail.

**Notice**

Work submitted should be your own. A strict action will be taken against a student who submits plagiarized homework or assignment. This includes zero marks in the submitted work, fine, failure in the course and expulsion from the degree program.