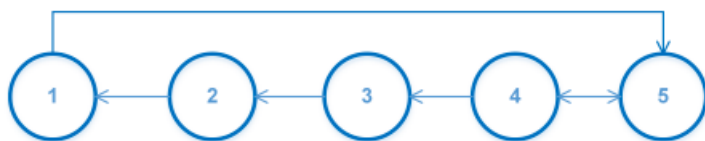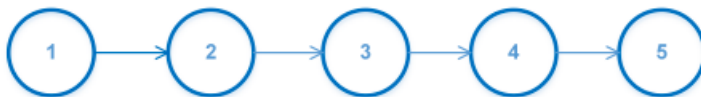**Problem 2.** (10 points) Consider three sensing/communication graphs A_1, A_2 and A_3 given in the following figure.

A1

A2

A3

1) For each graph, find the corresponding adjacency matrix $\mathcal{A}$, degree matrix $\mathcal{D}$, and Laplacian matrix $\mathcal{L}$.

2) Identify the undirected graph and directed graph; For directed graph(s), find all the spanning tree if it has.