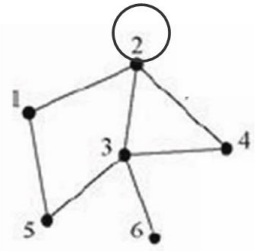
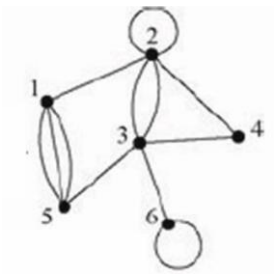
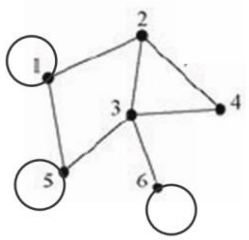
Homework assignments for Class #6

1. Graph properties







$$\begin{pmatrix} 0 & 1 & 0 & 0 & 3 & 0 \\ 1 & 2 & 2 & 1 & 0 & 0 \\ 0 & 2 & 0 & 1 & 1 & 1 \\ 0 & 1 & 1 & 0 & 0 & 0 \\ 3 & 0 & 1 & 0 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & 2 \end{pmatrix}$$

Which one of the graphs shown in the chart corresponds to the adjacency matrix shown on the right?

2. Technical question

In the simple example used in Slide 16, the eigenvalues of the Graph Laplacian matrix are shown not in the same order as their corresponding eigenvectors. It was mentioned in the lecture that one of the eigenvalues is always zero. Which of the eigenvectors corresponds to the eigenvalue = 0?

3. Programming assignment.

Modify the gcn_imbalanced,singletons.py code to make it use the ChebConv layer instead of GCNConv. Run the modified code at different values of the hyperparameter K in the range [1, 10]. Does the prediction accuracy improve with increasing the value of K? Explain the result.