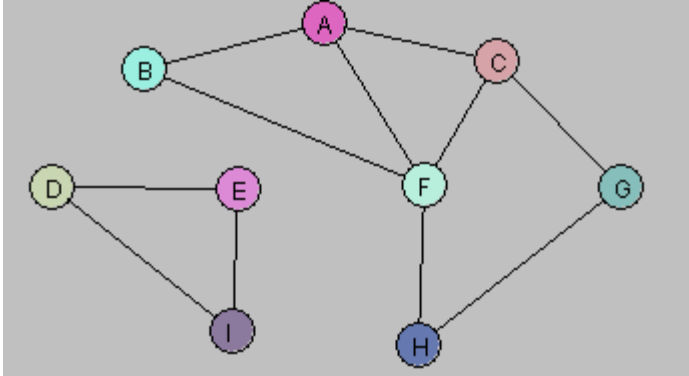


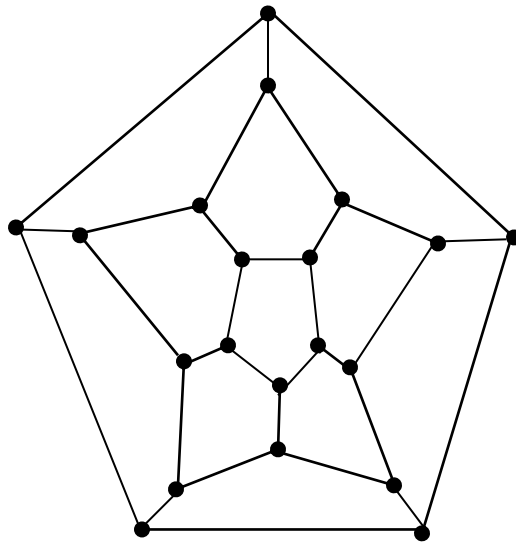
Lab 10

1. Answer questions about the graph $G = (V, E)$ displayed below.



- A. Is the graph G connected? If not, what are the connected components for G?
- B. Draw a spanning tree/forest for G.
- C. Is G a Hamiltonian graph?
- D. Is there a Vertex Cover of size less than or equal to 5 for G? If so, what is the Vertex Cover?

2. *Hamiltonian Graphs.* The following graph has a Hamiltonian cycle. Find it.



3. *Vertex Covers*. Create an algorithm (in pseudocode) for computing the smallest size of a vertex cover for a graph. The input of your algorithm is a set V of vertices along with a set E of edges. Assume you have the following functions available (no need to implement these):

- `computeEndpoints(edge)` – returns the vertices that are at the endpoints of the input edge
- `belongsTo(vertex, set)` – returns true if the input vertex is a member of the given set

Hint: Loop through all subsets of V . For each subset W , check to see if W is a vertex cover. Do this by looping through all edges; for each edge e , check to see if at least one of its endpoints lies in W .

4. <https://leetcode.com/problems/number-of-islands/description/>
5. <https://leetcode.com/problems/max-area-of-island/description/>
6. <https://leetcode.com/problems/word-search/description/>