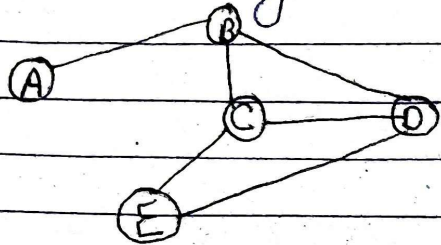


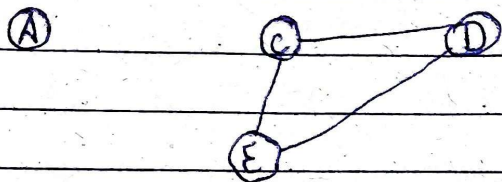
Q-1 What is cut vertex? find cut vertex in attached graph?

Ans-1 A vertex v in a graph G is called a cut vertex if deleting v from G increases the no. of components of G .

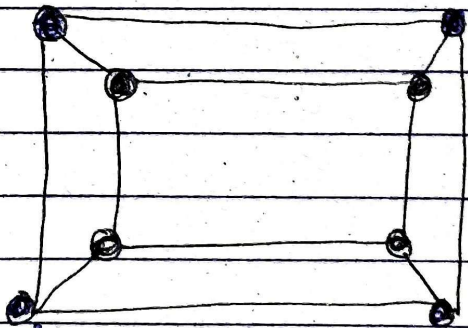
⊙ A tree with more than two vertices always has cut vertices (every non-leaf node is a cut vertex).



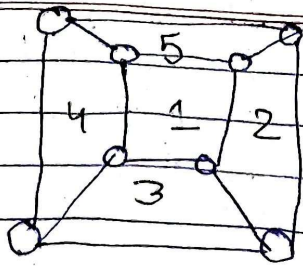
\Rightarrow The only vertex is a cut vertex.



Q-2 What are the regions of a graph? find region in graph?



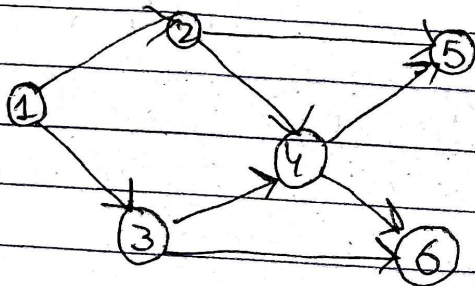
Sol: The first invariant of a planar graph will be the no. of regions that graph defines in plane. A region is a part of plane, completely disconnected off from other parts of plane by edge of graph.



The total regions in this 3-cube are 6 regions.

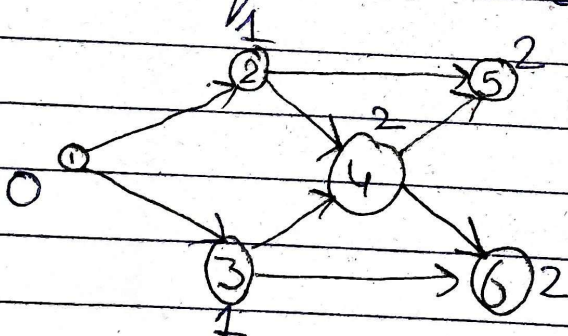
Q-3 Derive the topological ordering for following graph?

Sol:



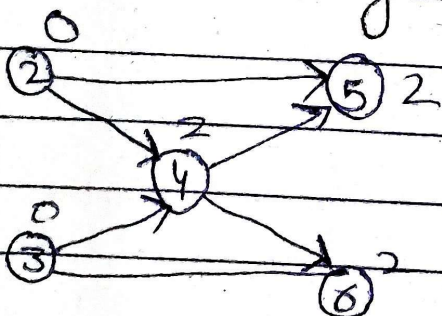
Sol: The topological ordering of a directed graph is a linear ordering of its vertices such that for every directed edge uv from vertex u to vertex v , u comes before v in ordering.

Step 1:



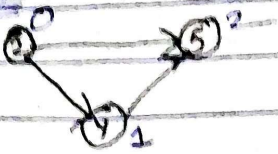
Write In-order

Step 2: 1 has least degree remove it and update degree-

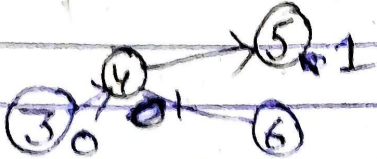
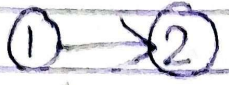


①

Case: 1



remove two



- 1 → 2 → 3 → 4 → 5 → 6
- 1 → 2 → 3 → 4 → 6 → 5
- 1 → 3 → 2 → 4 → 6 → 5
- 1 → 3 → 2 → 4 → 5 → 6

Case 2:

