1. Suppose that you have two strings on length $m$ and $n$. What is the worst case running time of a brute force algorithm for finding longest common subsequence of the two strings? For example suppose string $X$ to be XMJYAUZ and $Y$ be MZJAWXU then longest common subsequence is MJAU.

2. What are the minimum s-t cuts in this network (write down sets of vertices (A,B) for each cut)?

   ![Network Diagram](attached_image)

3. Draw the residual graph corresponding to the current flow in the graph. The edges in the figure are labeled by flow/capacity.

   ![Residual Graph](attached_image)

4. What is the meaning of $OPT(i, v)$ for the Bellman Ford algorithm for shortest path with negative weights?