Q. Six Reporters Arne(A), Barbara(B), Christine (C), Daniela(D), Elvis(E) and Frank(F), are to be assigned to six new stories Politics(1), Crime(2), Financial(3), Foreign(4), Local(5), sport(6). The table shows possible allocations of reporters to new stories. For example, Christine can be assigned to any one of stories 1, 2 or 4

	1	2	3	4	5	6
A					✓	
B	✓			✓		
C	✓	✓		✓		
D					✓	
E			✓		✓	✓
F				✓		

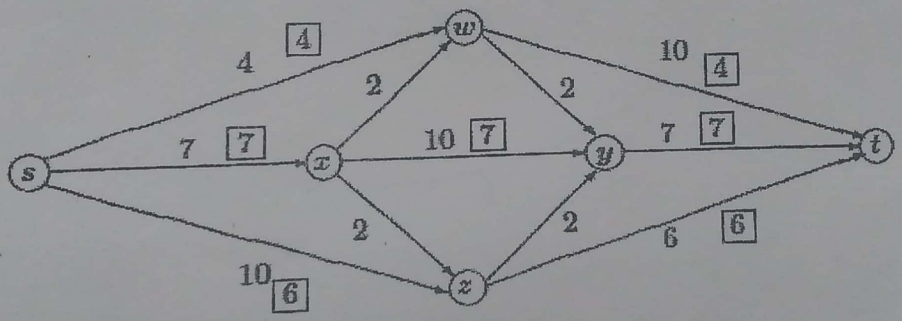
1. show these possible allocation on a bipartite graph.
2. Use Ford-Fulkerson to compute a maximum matching.
3. Is there a perfect matching? Explain your answer.

1. The figure below shows a flow network on which an s-t flow is shown. The capacity of each edge appears as a label next to the edge, and the numbers in boxes give the amount of flow sent on each edge. (Edges without boxed numbers have no flow being sent on them.)

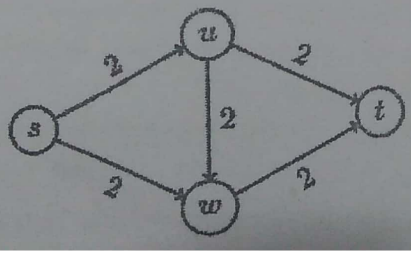
   (a) What is the value of this flow?

   (b) Is this a maximum s-t flow in this graph? If not, find a maximum s-t flow.

   (c) Find a minimum s-t cut. (Specify which vertices belong to the sets of the cut.)



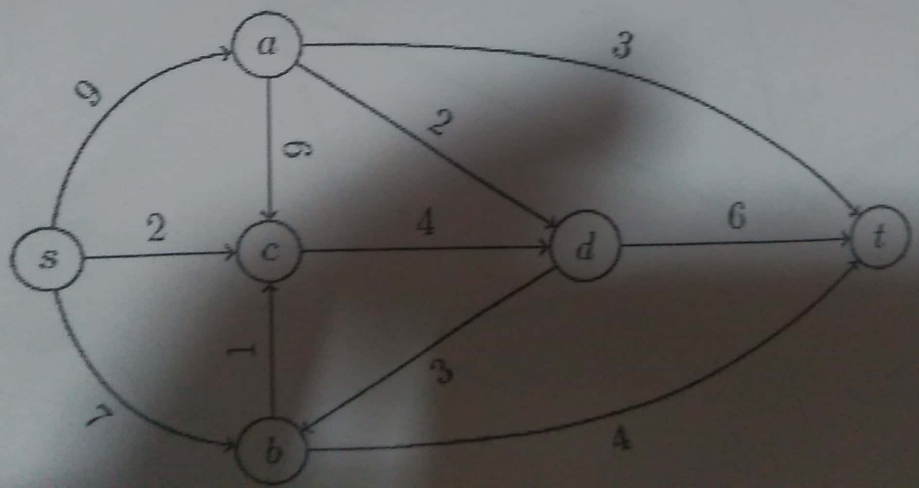
2. Find *all* minimum s-t cuts in the following graph. The capacity of each edge appears as a label next to the edge.



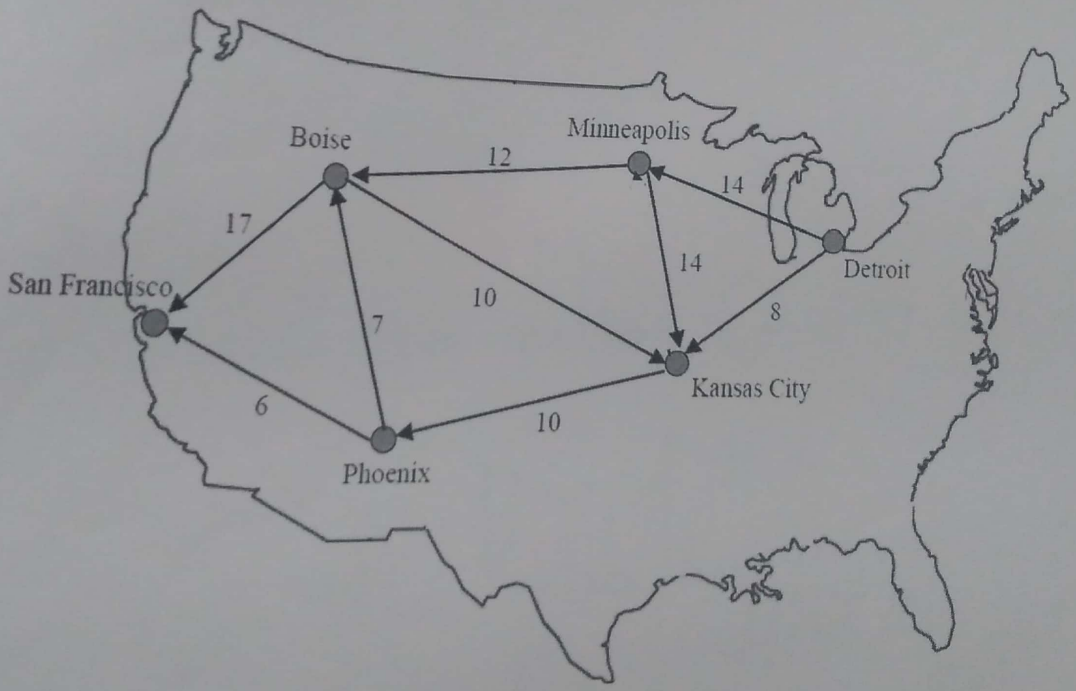
3. Consider the flow network H below with source s and sink t. The edge capacities are the numbers given near each edge.

(a) Find a maximum flow in this network.
Once you have done this, draw a copy of the original network H and clearly indicate the flow on each edge of H in your maximum flow.

(b) Find a minimum s-t cut in the network, i.e. name the two (non-empty) sets of vertices that define a minimum cut.



A company has a factory located in Detroit, USA, producing electric golf carts. The carts will be exported to Asian countries, and are therefore stored in a warehouse in San Francisco. All carts are shipped from the company to San Francisco by train. The train company operates trains daily on the national rail network. The carts are packed in train compartments, called bogeys. There is a limit on how many compartments can be shipped across each link of the train network daily. The network below shows the carrying capacity. What is the maximum number of bogeys that can be shipped out of Detroit each day?



Find max flow for above graph.