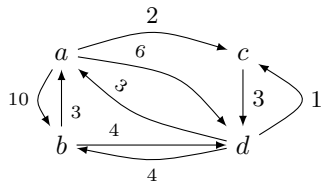
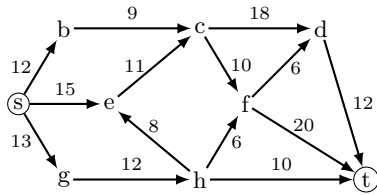


4. (1.5p) Let G be the weighted graph depicted below. Apply the Warshall algorithm to compute the matrix $WP^{[4]}$ of the lightest paths between any pair of nodes in G .

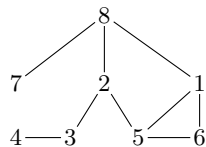


5. (1.5p) Find a maximum flow f in the flow network G with s and destination t depicted below. Draw $G + f$ and indicate the value $|f|$ of the maximum flow,



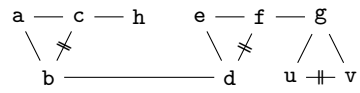
$|f| =$

6. (0.5p) How many different trees with 6 nodes, there exist?
 (a) 36 (b) 8 (c) 216 (d) 120 (e) 1296
7. (2p) Consider the following graph. Compute:
 (I) the chromatic polynomial $c_G(z)$ of G and
 (II) what is the chromatic number of G ?
 (III) how many 2-colorings has G ?
 (IV) how many 3-colorings has G ?



I	$c_G(z) =$
II	(a) 4 (b) 5 (c) 3 (d) 6
III	
IV	

8. (0.5p) Let M be the matching made of the edges marked in the graph G depicted below:



(a) Indicate the set of M -saturated nodes of G

(b) Is M a maximal? Motivate your answer.

Start: 1p