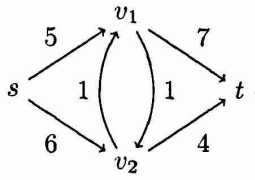
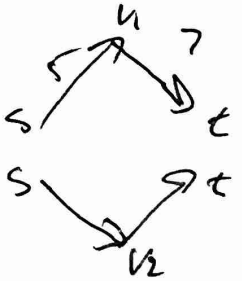
Name: _____

1. (15 points) Show the execution of the Edmonds-Karp algorithm on the following flow network G. For each iteration, show the flow f on the graph G, the residual graph G_f, and the augmenting path.



$f = 0$

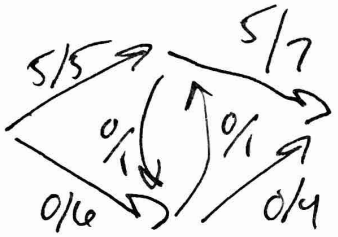
(1) $G_f = G$. Choose shortest path: $s \to v_1 \to t$ or $s \to v_2 \to t$



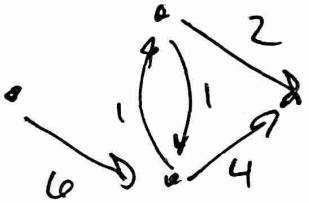
bottleneck cap. 5

bottleneck cap. 4

(2)

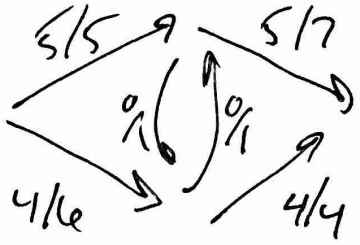


G_f

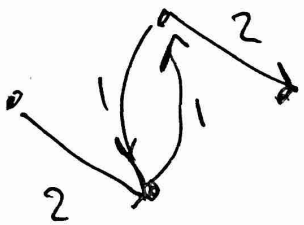


$s \to v_2 \to t$ w/ cap. 4

(3)

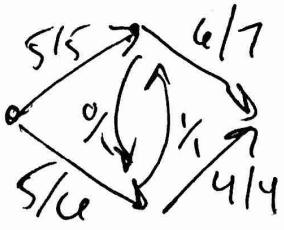


G_f



$s \to v_2 \to v_1 \to t$ cap. 1

(4)



G_f no path Done.

$|f| = 10$

(continued on other side)

2. (5 points) What is the minimum cut corresponding to the maximum flow on this network? Explain your answer.

$\{v_1, t\}$, $\{v_2, s\}$

Capacity ~~Flow~~ into $\{v_1, t\}$ is $5 + 1 + 4 = 10 = |f|$