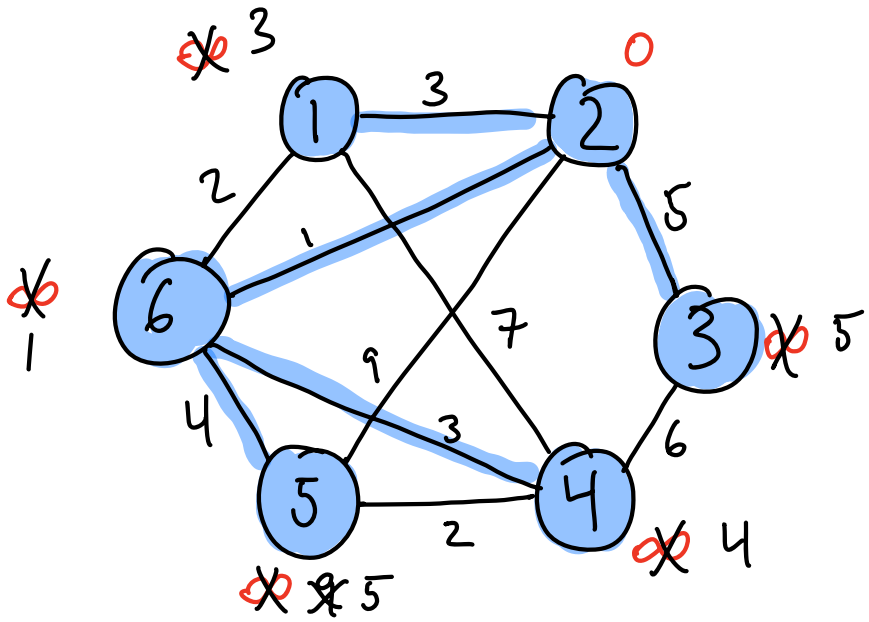
(18 points total). Consider the adjacency matrix A for an undirected graph.

$$A = \begin{array}{c} \begin{matrix} 1 & 2 & 3 & 4 & 5 & 6 \end{matrix} \\ \begin{bmatrix} 0 & 3 & 0 & 7 & 0 & 2 \\ 3 & 0 & 5 & 0 & 9 & 1 \\ 0 & 5 & 0 & 6 & 0 & 0 \\ 7 & 0 & 6 & 0 & 2 & 3 \\ 0 & 9 & 0 & 2 & 0 & 4 \\ 2 & 1 & 0 & 3 & 4 & 0 \end{bmatrix} \end{array} \begin{matrix} 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \end{matrix}$$

(b) (8 points) Run Dijkstra's algorithm on the graph starting from node 2. Report what $v.d$ and $v.\pi$ is for each node **right after finishing the third iteration of the while loop** (i.e., right before calling ExtractMin for the fourth time). Draw the shortest path tree obtained by running the *full* algorithm.



Iteration	node		1	2	3	4	5	6
		π	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$
0		d	∞	0	∞	∞	∞	∞
		π	2	$\emptyset$	2	$\emptyset$	2	2
1		d	3	0	5	∞	9	1
		π	2	$\emptyset$	2	6	6	2
2		d	3	0	5	4	5	1
		π	2	$\emptyset$	2	6	6	2
3		d	3	0	5	4	5	1
		π	2	$\emptyset$	2	6	6	2
4		d	3	0	5	4	5	1
		π						
5		d						