

Name _____

No aids allowed. Answer all questions on test paper. Use backs of sheets if necessary.

This is Kruskal's algorithm:

- 1: Sort the edges: $c(e_1) \leq c(e_2) \leq \dots \leq c(e_m)$
- 2: $T \leftarrow \emptyset$
- 3: **for** $i : 1..m$ **do**
- 4: **if** $T \cup \{e_i\}$ has no cycle **then**
- 5: $T \leftarrow T \cup \{e_i\}$
- 6: **end if**
- 7: **end for**

Show that the following is a loop invariant: after Stage i , $T \cup \{e_{i+1}, \dots, e_m\}$ is connected, provided that the input graph $G = (V, E)$ was connected.