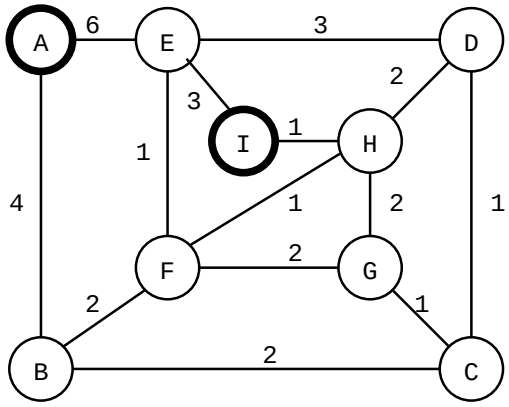
CS347 SP2005 Quiz 2

This is an open-book open-notes quiz. The *only* prohibited items are electronic devices. Mark every sheet of paper you use with your name and the string "cs347sp2005 quiz2" (omittance, even if it is partial, will be penalized at 1 point per sheet). If you are caught cheating, you will receive a zero grade for this quiz. The max number of points per question is indicated in square brackets after each question. The sum of the max points is 28. You have 28 minutes to complete this quiz. Good luck!

The following questions on this page are about the following state space graph. Let A be the start state and I the goal state. The edge labels indicate step-cost, the vertex labels contain the node identifier in the form of a letter. The order in which successors are generated is counterclockwise, ending at exactly 9 o'clock. Example: H generates first F, then G, then D, and finally I. When sorting by f-value, nodes with equal f-value are ordered such that the earlier a node is generated, the higher its priority. Nodes already on the open list have higher priority than newly added nodes with equal f-value. Heuristic $h(node)$ is defined in the following table:

node	h(node)
A	3
B	1
C	4
D	2
E	3
F	2
G	2
H	1
I	0



1. What is the diameter of this state space? Explain your answer! [2]
2. Give the execution trace for Uniform Cost Graph Search (UCGS). [8]
3. Is UCGS optimal for this problem? Explain your answer! [2]
4. Give the execution trace for A^* Graph Search (A^*GS) employing heuristic h. [7]
5. Is for this problem h admissible? Explain your answer! [4]
6. Is for this problem h consistent? Explain your answer! [3]
7. Is A^*GS employing heuristic h optimal for this problem? Explain your answer! [2]