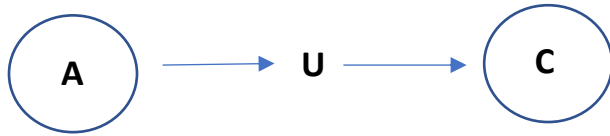


## Problem 2

Suppose a directed graph is given as:



Let's C be our first root on which DFS will be run. The algorithm starting with C, will mark it explored after exploring all its outgoing nodes and hence, they will form a separate tree. Then the algorithm will choose a second root, let's say U, now since the only outgoing node from U (node C) is already explored, the algorithm will mark U as explored after which it may select A as the third root. As a result, U will be a tree containing itself because it has no other outgoing nodes to be explored.