Algorithms and Operating Systems (ICS331)

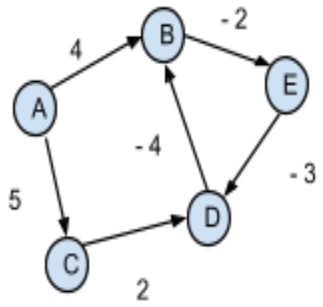
Assignment Set -2

Clearly mention the following details.
Name:
Roll Number:

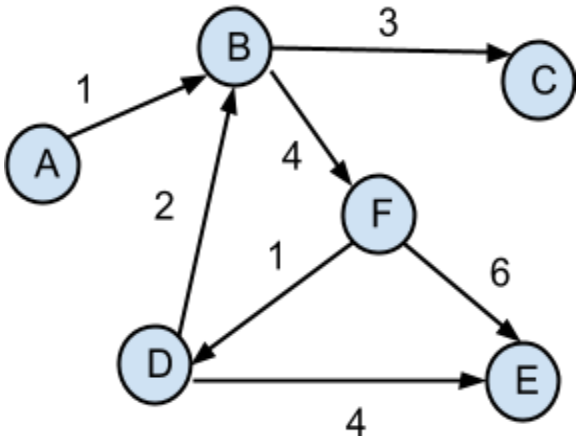
Deadline : September 26th, 2013, 3:30PM

1. Take an example graph with 8 nodes and apply DFT algorithm on it. Show clearly the order in which the nodes are accessed in each iteration.

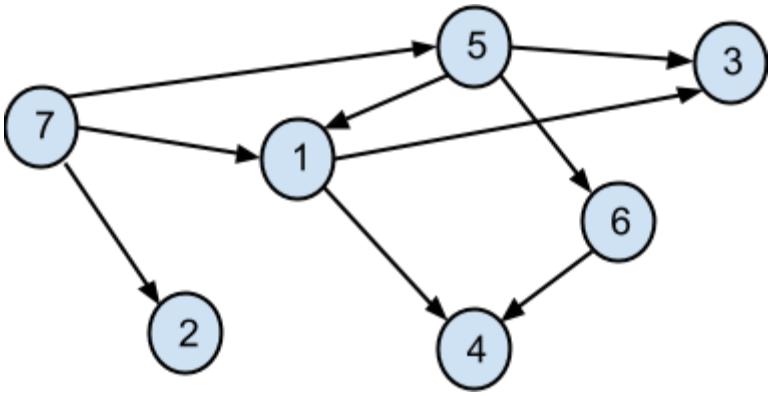
2. Write an algorithm to detect whether the below graph has negative weighted cycle or not. Any show the cycle, if there is any.



3. Write an algorithm to find whether the given graph has cycles or not. Implement that algo on the graph [Hint: Use DFT]



4. Write an algorithm for topolgical sort and find the topological ordering for the nodes in the below graph, if there exists any.
   Definition: **topological ordering** of a directed graph is a linear ordering of its vertices such that for every directed edge *uv* from vertex *u* to vertex *v*, *u* comes before *v* in the ordering without any cycles.



5. Determine the hamiltonian path, Eulerian path and Hamiltonian cycle in the given graph.
   Definition: A **Hamiltonian path** is a path in an undirected or directed graph that visits each vertex exactly once. (All the vertices should be covered).
   A **Hamiltonian cycle** is a Hamiltonian path that is a cycle.
   An **Eulerian path** is a trail in a graph which visits every edge exactly once.