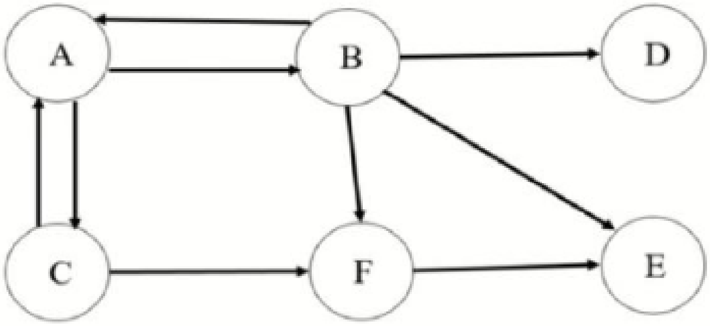
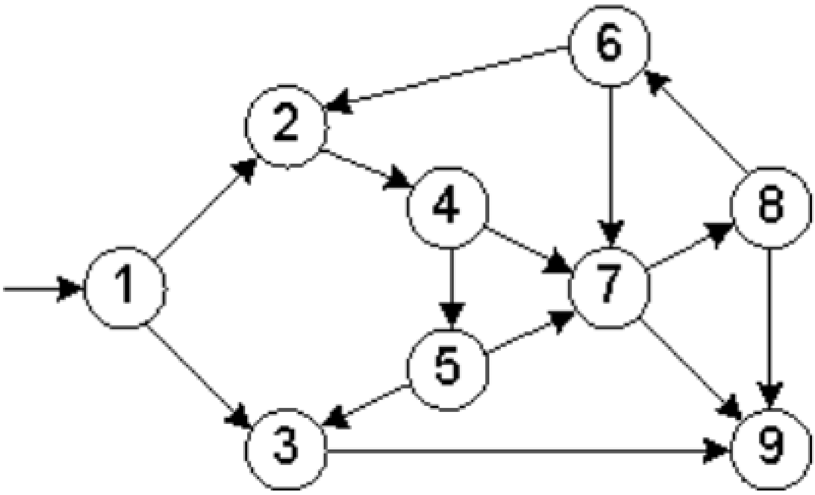
# DIGITAL ASSIGNMENT 4

## ABHIRUPA MITRA – 17BCE0437

a) Write a python program to find the ranks for the given graph. Use the damping factor as d =0.85. Perform **8 iteration** and print the final iteration value only in the decreasing order for all the nodes.



b) Find the Hub and Authority score for the given graph.

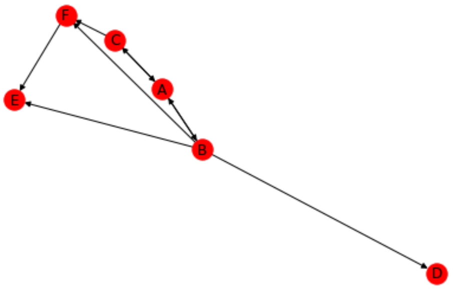


In [25]:

```
import networkx as nx

dg=nx.DiGraph()
dg.add_nodes_from(['A','B','C','D','E','F'])
# print(G.nodes.data())
```

In [31]:

```

dg.add_edges_from([('A','B'),('A','C'),('B','A'),('B','D'),('B','E'),('B','F'),('C','A'),('C','F'),('F','E')])
# print(G.edges.data())

nx.draw(dg, with_labels=True)
```



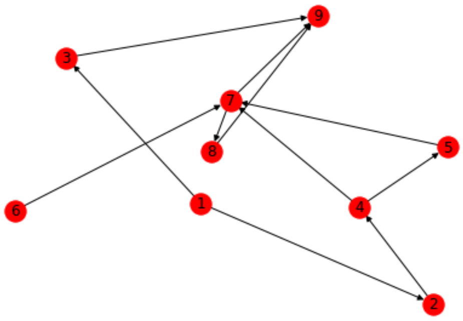
In [41]:

```
# pg=nx.pagerank(dg, alpha=0.85, personalization=None, max_iter=8 dangling=None)
pr=nx.pagerank(dg,alpha=0.85, max_iter=100)
print(pr)
```

```
{'A': 0.17091755418612645, 'B': 0.1487378852697941, 'C': 0.1487378852697941, 'D': 0.10770420363755587, 'E': 0.252984917
4506029, 'F': 0.17091755418612645}
```

In [42]:

```
dg1=nx.DiGraph()
dg1.add_nodes_from([1,2,3,4,5,6,7,8,9])
dg1.add_edges_from([(1,2),(1,3),(2,4),(3,9),(4,5),(4,7),(5,7),(6,7),(7,8),(7,9),(8,9)])
nx.draw(dg1, with_labels=True)
```



In [50]:

```
a,h=nx.hits(dg1, max_iter=100, tol=1e-08, nstart=None, normalized=True)
print("Authority Score:", a)
print("\n\nHub Score:", h)
```

```
Authority Score: {1: 2.1756310743594324e-09, 2: 1.2663839584911663e-19, 3: 0.1464466090881124, 4: 0.20710678073595956,
5: 0.1464466090881124, 6: 0.1464466090881124, 7: 0.20710678073595956, 8: 0.1464466090881124, 9: 0.0}


Hub Score: {1: 0.0, 2: 2.626219015139076e-09, 3: 2.626219015139076e-09, 4: 3.057321318354313e-19, 5: 0.1464466086375245
, 6: 0.0, 7: 0.35355338873625647, 8: 0.1464466086375245, 9: 0.35355338873625647}
```