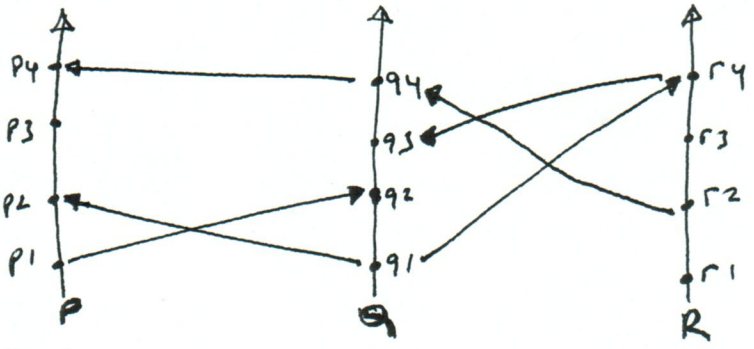
Name: _____

Person#: _____

CSE 421/521 - Quiz 5

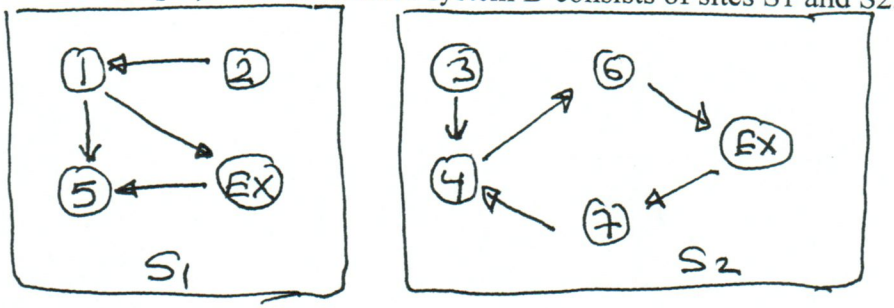
Question 1 (10pts): Consider the following diagram which shows the relative time for three concurrent processes: P, Q, and R.



Are the following statements true or false?

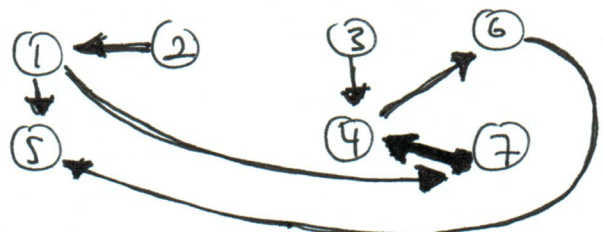
a) **p1 happens before r4** : false
b) **q1 happens before p3** : true
c) **r1 happens before q3** : true
d) **p2 and q2 are concurrent processes** : true
e) **q4 and p4 are concurrent processes** : false

Question 2 (15pts): The distributed system D consists of sites S1 and S2.



Considering the above local wait-for graphs at sites S1 and S2, is the system D in a deadlocked state? If so, which processes are involved in the deadlock? Show how you would check the existence of a deadlock:

Since we are given "extended" wait-for graphs with EX nodes on each site, we first run the "distributed" deadlock detection algorithm. According to this algorithm, site S2 has a local cycle which includes an EX node, hence we also need to construct the "global" wait-for graph to determine whether there is a deadlock or not:



In the global wait-for graph, there is no cycle, so we conclude that the system is NOT in deadlock!